ENGINEERING NEWS-RECORD

New job in Iraq – Irrigation gate

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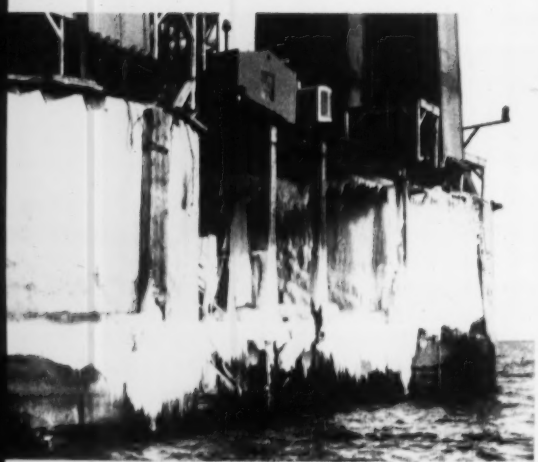
World's longest suspension bridge stretches four miles across the Straits of Mackinac joining Michigan's upper peninsula with the rest of the state.

Wrought Iron Plates protect Mackinac Bridge pilings against corrosion and spalling



Welded wrought iron plates extending ten feet above and eight feet below the waterline, form a bulwark of protection against corrosion and ice.

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Consulting Engineer D. B. Steinman, New York, met these requirements by specifying over 270 tons of ⅜-inch wrought iron plates. These plates do double-duty . . . combatting corrosion and guarding pilings against stress and subsequent spalling under dense ice formations.

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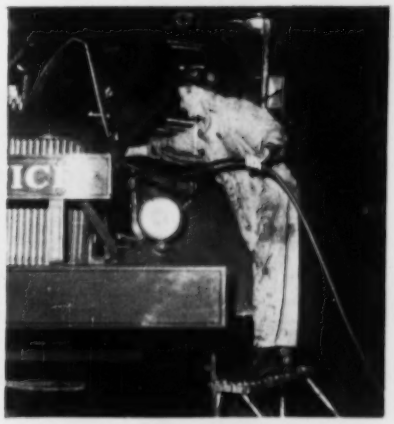
A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco.

Available in Canada and throughout the world

BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS

Corrosion costs you more than Wrought Iron



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ORTAC HOSE for Universal Use

A Extra-tough cover resists weather, oil, sun, abrasion

B Vertical braids of high-tensile rayon cord for exceptional strength with great flexibility

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ORTAC (Oil-Resistant Tube and Cover) is available in long, continuous lengths in sizes from 3/16" to 1½ i.d.

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You've never seen anything like ORTAC by Goodyear. With this one hose, you can feed compressed air to drills–gas up trucks and rolling stock–feed lubricants to equipment–carry water –even handle weak acids and alkalies should the need arise. In fact, it does all the jobs that used to call for five different kinds of hose–does them all easily and safely, too.

And ORTAC is recommended for the ruggedest kind of service by the G.T.M.–Goodyear Technical Man. For its tube is of CHEMIGUM, Goodyear's exclusive rubber synthetic that's exceptionally oil-resistant. It's heavily muscled to take constant dragging over rocks and rubble–everlasting stretching and straining – habitual rough handling. Yet it's amazingly flexible and easy to use.

It's easy to see, then, how a five-use hose like this eliminates any need for a large hose inventory – can substantially cut your costs on every job. For the full ORTAC story, contact your nearest Goodyear Distributor or write:

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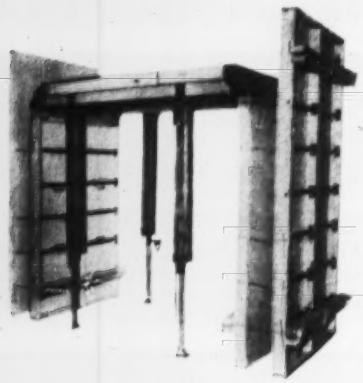
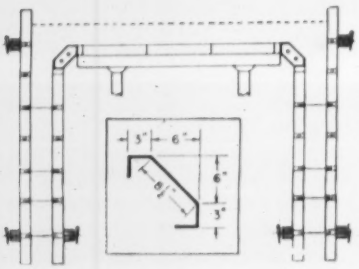


Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.

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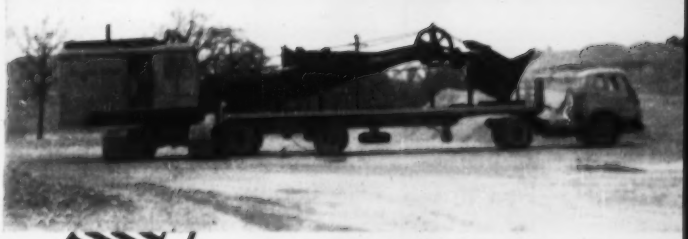
Boom and Basic Machine travel to job on separate trailers.

ONLY 4 HOURS FROM START TO WORK!



Boom is fitted to basic machine.

WHAT is it costing you to move a 2½-yd. Shovel from job to job? How much is lost in time? Some machines in this capacity range, take up to two-days and require an extra crane.

Your Northwest 80-D, 2½-yd. Shovel can be reduced in weight for road travel and be on the job in a matter of hours. Northwest 80-D's have been dismantled, put over the road 20 miles and working on the job in 8 hours. The machine pictured, owned by the Consumers Company of Milwaukee, was dismantled, loaded on trailers, erected and on the job in only 4 hours.

Moving your Northwest 80-D is a simple operation. The boom is lowered to the truck or trailer bed and unbolted from the base. Cables and Crowd Drum are part of the boom assembly. Cables are coiled back on the boom. The basic machine backs out and loads itself on another trailer. The procedure is reversed on arriving at the job and the machine goes to work. Further reduction in weight can be had including removable counterweight on your Northwest. No crane is needed. Two men with ordinary tools can do the job! It is quick, easy and a real time and money saver. Another of the many Northwest advantages for making money for you. Ask for details.

Four hours later the Northwest is fully assembled and at work.

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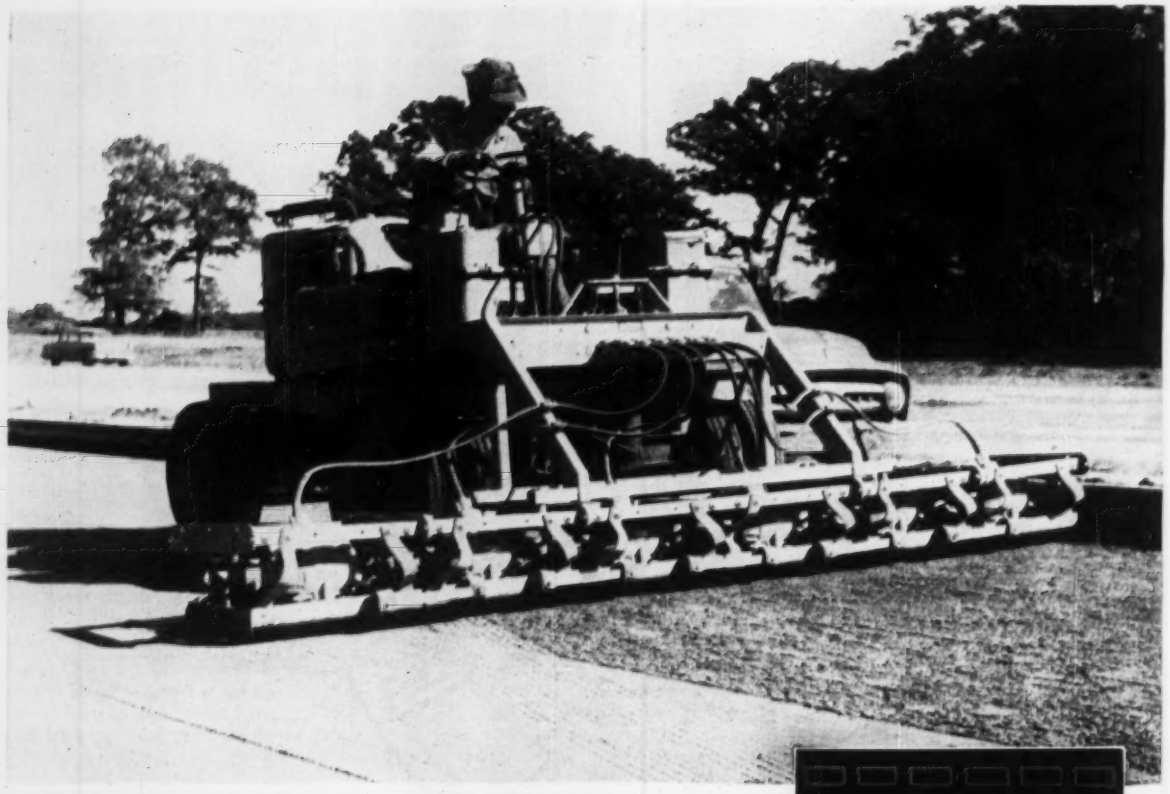
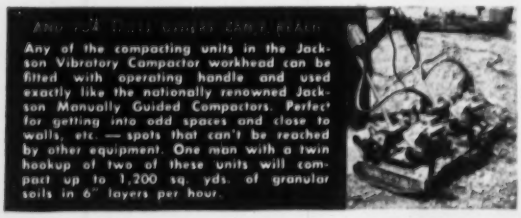


THE NEW JACKSON

HANDIEST and MOST PRODUCTIVE OF ALL COMPACTORS

If you are interested in the purchase or rental of a compactor for consolidating any of the materials normally used in macadam base or sub-base courses, granular soil fills or other projects, you will do yourself a big favor by investigating the new JACKSON MULTIPLE VIBRATORY COMPACTOR. It will give you 100% of specified density in a hurry because it is extremely powerful. Each unit in the workhead delivers up to 4200 THREE-TON BLOWS PER MINUTE. Total coverage is what you want it to be, up to 13', 3", and speeds are from 0 to 10 MPH. Moreover there is no machine that begins to match the JACKSON for quick, easy and ideal adjustment to each and every job requirement. This exceptional versatility saves a lot of time, eliminates lost motion and permits you to compact areas that other machines cannot touch. (See examples of unit arrangement at right.) It's a vastly improved version of the previous JACKSON COMPACTOR which was used most successfully on nearly all the nation's major paving projects. By all means inspect this machine or write for literature.



Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.

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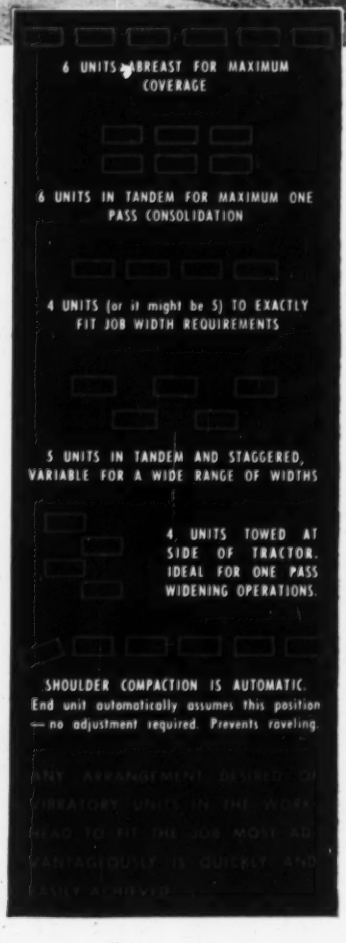
6 UNITS ABREAST FOR MAXIMUM COVERAGE
6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION
4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS
5 UNITS IN TANDEM AND STAGGERED, VARIABLE FOR A WIDE RANGE OF WIDTHS
4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.
SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.

JACKSON VIBRATORS, INC.

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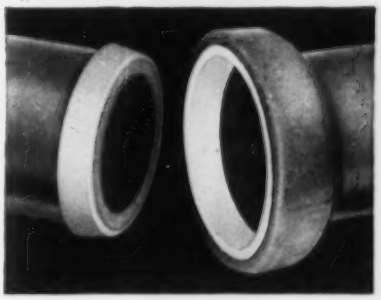
lower installation costs FIVE WAYS with longer, stronger AMVIT Clay Pipe

Outstanding Mechanical Joint of Plasticized Resins of Polyvinyl-Chloride Gives Lower Cost-In-Place



A million dollar expansion program to increase production facilities for Amvit® was completed earlier this year. New horizontal extrusion machines now manufacture pipe in over four feet lengths.

Longer lengths lower installation costs, reduce the number of joints, lessen the number of pipe sections to be handled. *Here's how you can save on installation with Amvit:*

1 SAVES LABOR

No other materials such as caulking, joint compounds, hot pots or ladles are needed to make the Amvit Joint. The joint is on the pipe delivered to the job ready for use. Nothing else is needed. Just push the pipe together and the joint is complete.

2 IMMEDIATE BACKFILLING

As soon as the joint is made, backfilling can start. No need to wait for unnecessary delays caused by bad trench conditions, high-water table, unstable ground or running sand. Barricades can be removed and streets opened days sooner.

3 QUICK TESTING

No need to wait days to see if a line has passed test. A look at the completed joint will tell. Thus, engineers can inspect and accept the line allowing the contractor to receive payment quicker.

4 PERMITS DEFLECTION, ABSORBS SHOCKS

Amvit is made from a plastic which has many characteristics similar to rubber. It is pliable, permitting deflection without leakage. It is resilient, can absorb shock and vibration. This allows for settlement of pipe in poor ground conditions after backfilling.

5 COMPLETE FITTINGS

Amvit is furnished on all standard fittings, as well as pipe. This will permit a uniformly tight line from house wall to treatment plant.

Amvit line being installed in Amherst, Ohio

For more information on how Amvit can help cut your sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

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CLEVELAND OHIO

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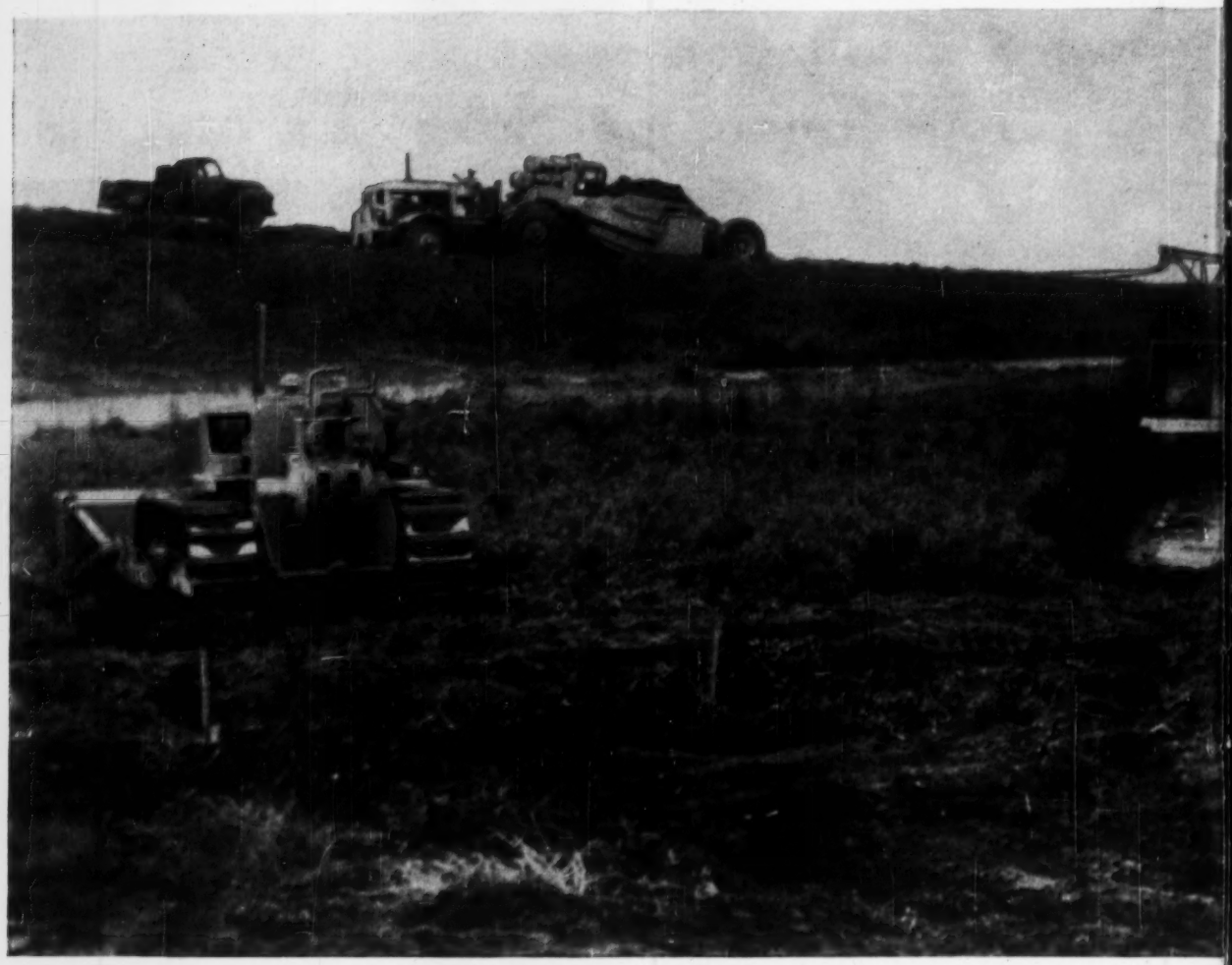

Gulf Products and Fine Service keep equipment rolling on South

From left to right: H. H. Lane, Gulf's Greenville, S.C. District Sales Representative; P. C. Cochran, Owner, P. C. Cochran Construction Co., York, S.C.; Edley Lattimore, Superintendent, P. C. Cochran Construction Co.

In Spartanburg and Cherokee Counties, P. C. Cochran Construction Company of York, South Carolina, is moving over 2,000,000 cubic yards of earth to give the Palmetto state better roads. Cochran, who uses Gulf products for all his equipment, has been awarded three sections on this, the second interstate project let in South Carolina under the Federal Highway Program.

Cochran's part of the project is over 19 miles long. On a project of this size, Cochran Construction has to be sure of prompt delivery and peak performance from the petroleum products they use. That's why they "go Gulf." Edley Lattimore,

Equipment at work on Borrow Pit near Highway 29, Spartanburg County, S.C. P. C. Cochran, Contractor and 100% Gulf customer, has been awarded three sections of this project, the second interstate project let in South Carolina under the Federal Highway Program. The sections, totaling more than 19 miles in length, will require over 2,000,000 cubic yards of excavation.

Carolina Interstate Highway Project

Cochran Superintendent, says, "We couldn't be more satisfied with Gulf products and service."

Gulf has what it takes to serve you, too. Fifteen hundred warehouses are so located as to provide you swiftly with the finest in fuels and lubricants on short notice. A Gulf Sales Engineer, backed by 1300 scientists and technicians at the Gulf research labs, stands ready to keep you up to date on the latest developments in petroleum science. He'll offer expert advice on the use of petroleum products too . . . all at no cost whatsoever. Want full information? Call your nearest Gulf office today or mail the coupon.

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Soil Stabilization . . .

Lime Left Out?

SIR—The article "Stabilizing a Problem Soil—Cheaply", by J. W. Lyons of Monsanto Chemical Co. (ENR Aug. 15, p. 101) describes some interesting research on the development of chemical soil stabilizers, but it does contain some statements which should be corrected.

1. The author states that clay soils "having a Plasticity Index of above about 15 are almost impossible to treat with today's commercially available stabilizers." Hydrated lime has and is being used to treat clay soils in both the base and subbase that have P.I.'s as high as 40 to 50+. A few of these projects are nine years old and are still in good condition. Many of these projects are 5 to 20 miles in length.

2. The author states that "lime is being used from 4 to 10%" (it is presumed he means by weight) to treat clays, and that this stabilization method is "experimental". This organization has followed the details of nearly every lime stabilization job from its inception. Never has 10% of lime been specified even experimentally. On only one experimental stretch has 8% been employed and that was on a fine-grained Texas "black waxey" clay which had a P. I. of 48 to 50. The average amount of lime specified is 3 to 4% by weight; with some lower P. I. (10 to 15) clay-gravels only ½ to 1% of lime hydrate is used (e.g. Rio Grande Valley of Texas).

With respect to the word "experimental" being applied to lime stabilization to date, well over 1,000 miles of all types of road have been constructed with lime in the base; it is currently being used in the highest type of road, a four-lane, divided Interstate Freeway U.S. 81 which will be the main north-south artery in Texas between Dallas and San Antonio. The minimum amount of hydrated lime used or scheduled to be used on this freeway totals 22,000 tons.

3. The author refers to "the drawbacks of large volumes (of lime) to be handled". An average of 3 to 4% by weight has interested many engineers in lime's stabilizing possibilities because of the *low* volume required.

4. The author's inference on "variations in calcium-magnesium ratios in the available lime sources" as being a complication in its use is not clear. State highway departments of Texas, Louisiana, Kansas, Maryland, Ohio, and other states using lime have simply specified ASTM specification C-207, the Type N Mason's Hydrated Lime specification which is generally met by all high calcium and dolomitic lime producers.

5. The author states that the phosphoric acid stabilizer developed by his company "will be noticeably less than for presently used stabilizers". It is believed that this conclusion is rather premature under the circumstances.

ROBERT S. BOYNTON
General Manager
National Lime Association
Washington, D. C.

. . . Soil Stabilization

Reasons Why

SIR—In regard to Mr. R. S. Boynton's letter on the subject of soil stabilization and our recent paper in ENGINEERING NEWS-RECORD on the potentialities of phosphoric acid, we in no way wished to dispute the value of lime in this field, nor to engage in public controversy by deprecating the lime-soil treatment.

However, it is felt that some benefit may be gained by expanding on the points raised by Mr. Boynton.

1. In our references to "commercially available stabilizers", we did not include lime in this category. Our contacts with various federal, state, and university groups have indicated that they regard lime stabilization as still in the experimental field stage. In view of this general feeling, we felt it wise to compare our process with the more established methods of soil stabilization; i.e., soil-cement, and soil-asphalt. This is not to deny that soil-lime is gaining favor currently and that it undoubtedly has a place in soil work.

2. Our reference to the use of lime at from 4 to 10% by weight was based on information gained from the above mentioned groups, and we have on hand at least one reference to laboratory experimentation using 10% by weight of lime. However, we would not argue with Mr. Boynton's figures relating to the average use levels and we stand corrected.

3. Our reference to "the drawbacks of large volumes to be handled" is based on the low bulk density of lime samples used in at least one state. The bulk density of a recent sample was 0.4 grams per cc so that 3-4% by weight of lime represents 7.5-10% by volume. On the other hand, 85% phosphoric acid has a density of 1.7 grams per cc so that 2% by weight of phosphoric acid represents only 1.4% by volume, or 4.5-7.1 times less by volume than lime. This is considered to be an advantage.

4. Our reference to variations in calcium-magnesium ratios in different lime sources is due to the fact that low magnesium limes are said to perform less effectively in soil stabilization than high magnesium limes. Reference is made to a paper on this subject—"The Calcium-Magnesium Ratio—An Important Factor in Soil-Lime Stabilization" by Lu, Davidson, Handy, and Laguros of Iowa State College presented at the 1957 Annual Meeting of the Highway Research Board. The specification of ASTM C-207 is of no help in this regard since it only requires a minimum percentage (95%) of combined magnesium and calcium oxides and says nothing about the relative amounts of each.

5. Mr. Boynton, in his fifth and final point, takes us out of context. His quotation, when completed, reads: "Since a small volume of high specific gravity liquid is being employed, the costs attendant to hauling and storage will be noticeably less than for presently used stabilizers." Note that the claim for reduced cost is made for only a part of the stabilization process. We have deliberately emphasized the experimental nature of our work in this article because we did not want premature conclusions to be drawn; ie., "The development of phosphoric acid as a stabilizer for heavy clay soils in road building is still largely in the laboratory. . . . Further laboratory investigations are being conducted in close cooperation with state highway departments. . . . Thorough evaluation of the performance of the resulting test strips will determine the final judgment on this new method of soil stabilization."

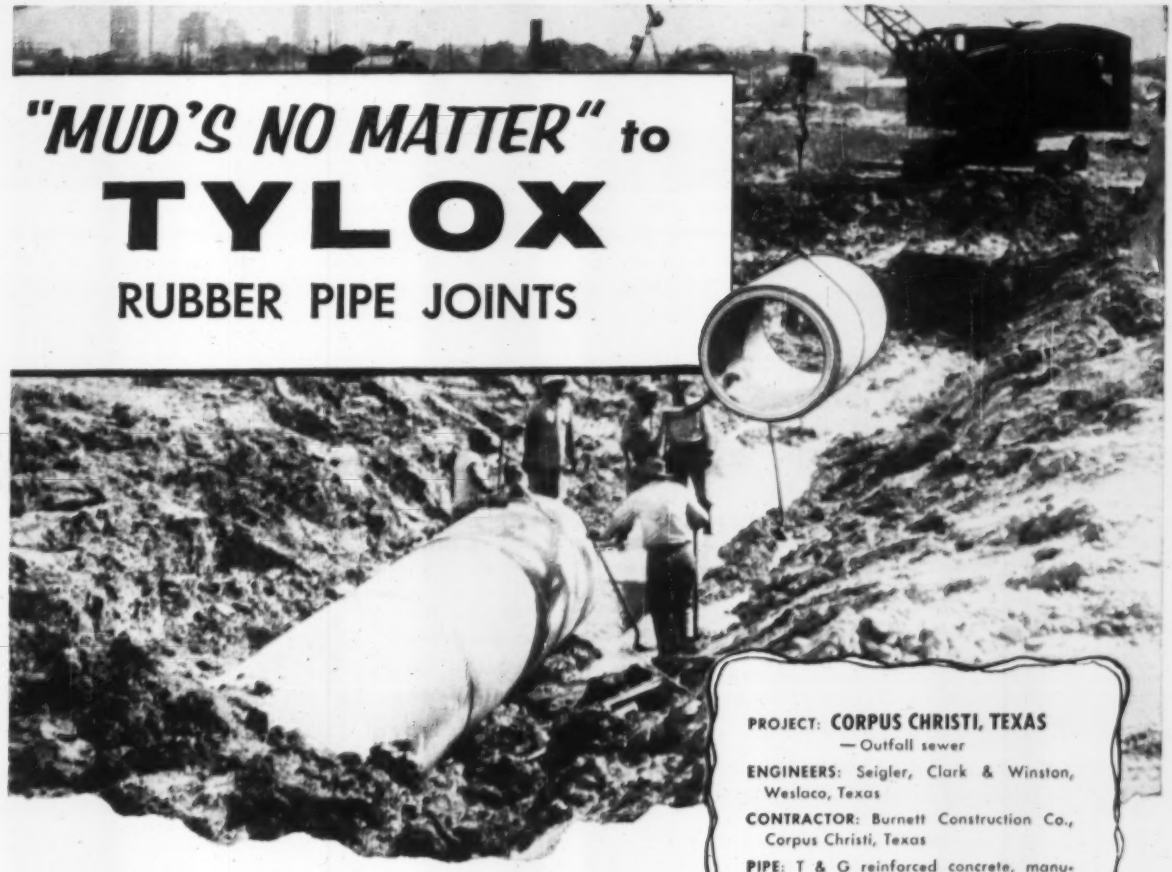
JOHN W. LYONS
Research Department
Monsanto Chemical Co.
St. Louis, Mo.

Correct Bridge Costs

SIR—In ENR Oct. 17, p. 321 is an article reporting recent costs of Florida bridges utilizing precast-prestressed parts. The text and tables are accurate with the exception of the last two para-

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

"MUD'S NO MATTER" to TYLOX RUBBER PIPE JOINTS



PROJECT: CORPUS CHRISTI, TEXAS — Outfall sewer

ENGINEERS: Seigler, Clark & Winston, Weslaco, Texas

CONTRACTOR: Burnett Construction Co., Corpus Christi, Texas

PIPE: T & G reinforced concrete, manufactured by TEXCRETE Company, Corpus Christi, Texas

MUD . . . as shown in the photo, was the prevailing condition on this outfall sewer project in Corpus Christi, Texas. Yet the "mucky" conditions did not slow up installation of the TYLOX-coupled 42" concrete pipe. The line was laid and backfilled as rapidly as the cranes could work, and the joints were *water-tight!*

In specifying TYLOX RUBBER GASKETS, engineers and officials knew they could count on faster pipe coupling to help reduce pipe installation costs, *whatever* the conditions might be. But that's not all . . . in specifying TYLOX they took advantage of a coupling material known also for its ability to make pipe joints leakproof and root-proof for the life of the pipe itself.

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It contains engineering data and fully illustrated case histories showing **why** TYLOX Rubber Gaskets are specified the world over to assure the economy, safety and longevity of sewerage and drainage pipe lines.

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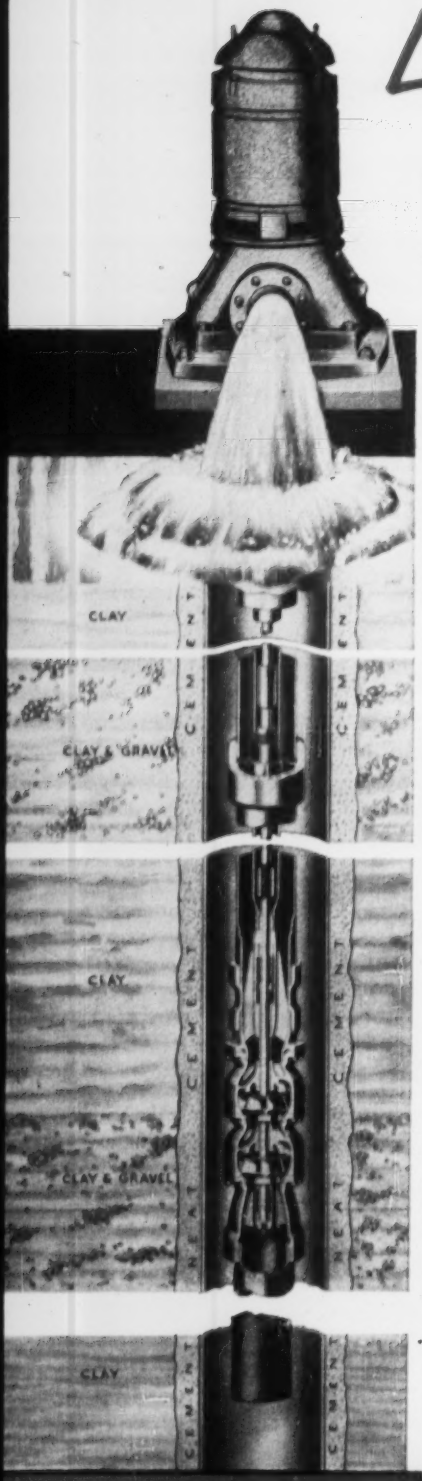

On whose say-so? Not on ours—but on the experience of scores of American and foreign firms and municipalities whose very existence and success depend on an adequate supply of water.

Knowing where the water is — and then tapping the subterranean source is but a part of the vast knowledge the Layne organizations have accumulated in three quarters of a century.

Once the source is determined and the water supply developed, a dependable means for delivering the water must be provided, and that's where the famous Layne pump comes in. For each Layne pump is specifically engineered for the particular job. There is no "stock" Layne pump. Your pump is created for your job —making use of the knowledge of strata, water requirements and usage.

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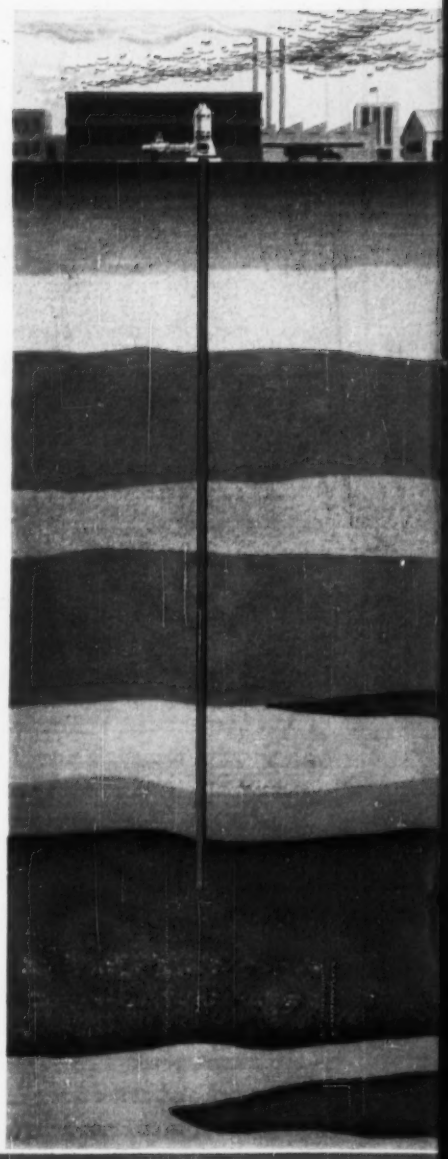

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A background of over 60 years of skill, a tradition of superior fabrication and erection, capacity to process bridges of all sizes and types—these things are basic in Fort Pitt Bridge's reputation for making delivery when promised.

Bridges illustrated: (Top right) 9-span cantilever for Cleveland's Innerbelt Freeway. (Lower right) Section of Pittsburgh's Penn-Lincoln Parkway. (Below) Double-leaf bascule on Toledo Expressway.

Call Fort Pitt Bridge Hurry-up jobs are our specialty!

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"There is no substitute for structural steel"

New Salem pipe line to augment present system will add approximately 50 MGD capacity to city water supply system.

a line of growth... for Oregon's capital city

American Concrete Cylinder Pipe is helping Salem, Oregon to grow

A simple but important fact is that no city, however great its potential, can grow beyond the capacity and dependability of its main water supply system.

Recognizing this fact, and envisioning a population in 30 years that will require three times the maximum capacity of present water transmission lines, Salem, the capital city of Oregon, is carrying out a program designed to meet future needs.

Under the direction of the City's Water Department Manager, John L. Geren, and the technical supervision of Consulting Engineers Clark and Groff of Salem, an 18-mile pipe line of 48" and 54" diameter American Concrete Cylinder Pipe is being installed by Lord Brothers, a general contracting firm of Portland, Oregon. This new line will triple the present capacity of the supply system.

The performance record of this type of reinforced concrete cylinder pipe has been so outstanding throughout the West that Salem can be confident that this water "growth line" will be giving efficient, economical service for many, many years to come.

Strength, permanence, sustained high carrying capacity, and trouble-free service are characteristics of American Concrete Cylinder Pipe which make it the right pipe for this forward looking city.

When planning your future water "growth lines," look to American's quality pipe line products, extensive production facilities and half century of experience.

Ask for complete information concerning the particular class of pipe that will meet your design requirements.

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graphs on p 322, which were not furnished by me. The data in these paragraphs are inaccurate both in statement and implication.

The crossings of Biscayne Bay are six-lane structures 84 ft wide between handrails, instead of the 60 ft reported. They are of varied heights and construction types; so an average cost per linear foot or per square foot is meaningless.

These crossings do utilize our first large-scale application of the AASHO-PCI Type IV beams. In 98 ft spans the cost of these beams, complete in place, is $31 per lin ft, with the highest of 5 bids at $32.50 per lin ft. The complete bridge superstructure in these 98 ft spans with Type IV beams is $7.78 per sq ft for all items above the pier tops.

W. E. Dean
Assistant State Highway Engineer
State Road Department of Florida
Tallahassee, Fla.

Hartford Interests Sydney

Sir—We read with interest the letter from the Metropolitan District Engineers' Club, Hartford Conn. (ENR Sept. 19, p. 8).

Our Engineering Club here was formed in 1936 and membership is now over 400, made up of members of the engineering staff of the Metropolitan Water Sewerage & Drainage Board, Sydney N. S. W., Australia.

We feel that mutual correspondence and association with similar Engineering Clubs throughout the world would be very desirable and would like to hear from any other such organizations.

A. Roberts
Secretary, Engineering Club
Metropolitan Water, Sewerage & Drainage Board
Sydney, Australia

Biggest Pipe Coupling

Sir—We note with great interest the announcement (ENR Oct. 10, 1957, p. 25) of the "Biggest Ring Coupling Shipped", in which a coupling measuring 151 in. in diameter and weighing 2,370 lb, was shipped to the Glendo Dam, by the Dresser Manufacturing Division.

In March of 1954, the R. H. Baker and Company Inc. produced the prototype of a flexible coupling for the Garrison Dam penstocks 294 in. in diameter, and weighing about 12,000 lb. So important was this development that a huge 57 ton testing device was built by our company, and the coupling subjected to many performance tests during which the pipes were expanded, contracted and articulated as reported in ENR April 29, 1954, under the heading "Testing Largest Flexible Pipe Coupling."

The coupling passed all its tests successfully, and presently 45 of them are installed at Garrison Dam.

Edward H. Schustack
President
R. H. Baker & Company
Los Angeles, Calif.

Editor's Note: Mr. Schustack successfully defended his title. The claim made for the Glendo Dam pipe coupling was apparently for the "light heavy weight" class.

When Is Design "Light"?

Sirs—By the increasing references to "light designs" and "heavy designs" in recent years, it appears that some designers are using the minimum requirements of building codes or else they are cutting below the minimum requirements. I should like to have the opinion of other engineers as to what basis of comparison is used in considering a design "light" or "heavy".

Too many owners are getting the idea that some engineers are in the possession of magic formulas which reduce cost. In a recent case the design for a steel frame of a shopping center appeared "heavy" to the owner's representative. He had another firm redesign the frame. The second firm's design showed a saving of $70,000.

It is true that ingenuity, experience, type of framing, column spacing, etc., affect engineers' cost. But assuming that two engineering firms, possessing equal ability and experience, use the same type of frame, loads and allowable stresses to design the same project independently, what would be the difference in cost between the two designs? Too many individuals think two designers designing the same project should produce identical results.

I. E. Morris
Morris, Boehmig & Tindel, Inc.
Atlanta, Ga.

CALENDAR

National Construction Industry Conference, 3rd annual conference, Congress Hotel, Chicago, Ill., Dec. 11-12.

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 6-10.

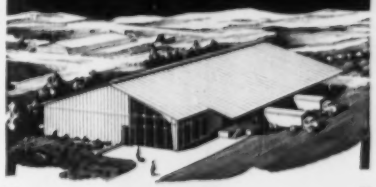
National Association of Home Builders, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 19-24.

American Road Builders Association, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 20-23.

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 26-30.

American Society of Heating and Air-Conditioning Engineers, annual meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., Jan. 27-29.

NEED A LOW-COST BUILDING FAST?



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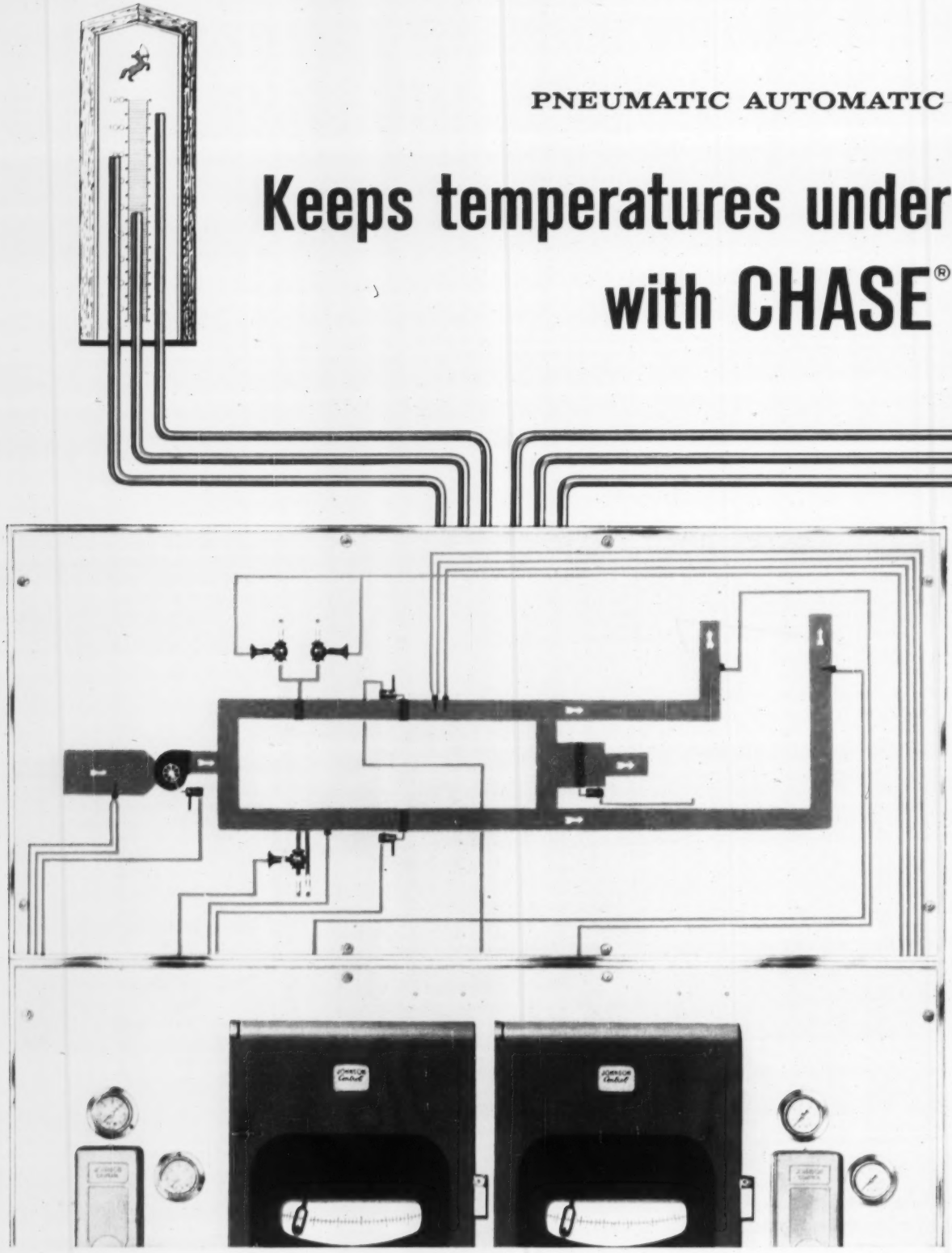
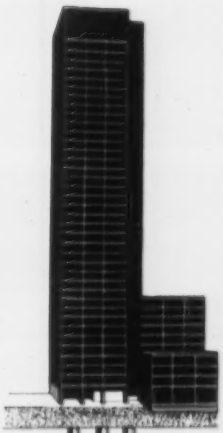


Typical pneumatic control panel has graphic illustration of Chase Copper Tube. Shows intricate pattern of tube controlling individual systems, of which there are thirty throughout the building from basement to penthouse.

CONTROL SYSTEM

control in Seagram Building copper tube!



BRONZE SKYSCRAPER HAS 30 MILES OF CHASE COPPER TUBE

3,000 control valves...1,000 thermostats...dozens of panel boards...all inter-connected by a 30-mile network of Chase Copper Tube! That's what it takes to control the temperature, flow and pressure of air, steam and water for the complete air-conditioning system in the monumental new bronze building at 375 Park Avenue.

Only the best would do for New York's most modern, most magnificent skyscraper. So for the installation of its Automatic Temperature and Humidity Control System, a completely pneumatic control system, utilizing Chase Copper Tube, was used. Based on past performance, Chase Copper Tube was chosen for its durability, low cost and attractive appearance.

Quick and easy to install, Chase Copper Tube saves both time and money...makes a virtually "permanent" installation, operating always at peak efficiency. In addition, Chase offers prompt, completely reliable delivery of desired quantities—a vital factor where storage is at a premium and delay costly.

For time-tested quality plus the service you require, plan your modern control installation with Chase Copper Tube!

Bending up over steam line, Chase Copper Tube can be installed quickly and easily; can be counted on for dependable service over the years.

Columns of Chase tube extend from each central control panel board to control-apparatus at remote points of air-conditioning system.

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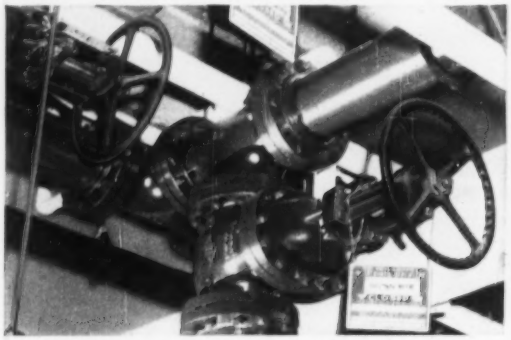
GRADY MEMORIAL HOSPITAL *selects* JENKINS VALVES *for long service life*

Looked at from any angle, Atlanta, Georgia's new $21,000,000 Grady Memorial Hospital—1069 beds, 17 operating rooms—is designed for economy in upkeep as well as efficiency. Like all operating equipment, the valves selected for this modern hospital had to pass a tough "physical".

Hospital authorities and builders had no difficulty agreeing on the specification "JENKINS" for all standard valves in the 21-story building. The extra measure of performance and reliability built into Jenkins Valves for generations assured long operating life, and low maintenance cost.

No other valves have such a long record of efficient, economical service. A good thing to remember when you select valves . . . especially since the valves that bear the famous Jenkins Diamond mark *cost no more.* Jenkins Bros., 100 Park Avenue, New York 17.



Valves on fire protection lines are among thousands of Jenkins Bronze and Iron Valves on duty at Grady Memorial Hospital.

JENKINS VALVES

LOOK FOR THE JENKINS DIAMOND

JENKINS SINCE 1864

Jenkins Bros

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ENGINEERING NEWS-RECORD

Vol. 159, No. 24 December 12, 1957

Number of copies printed this issue, 80,862

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THE CONSTRUCTION WEEK

SEPARATE BIDS NOT REQUIRED—The New York State Thruway Authority may continue to obtain single bids for construction of buildings under the authority's supervision, according to the state's Appellate Court Division. Justice William H. Coon ruled that the Thruway Authority "is a separate entity not bound by provisions of the State Finance Law which apply to state contracts." The ruling upheld a lower court which denied an application filed by two contractors' groups and a union asking that the authority be forced to let separate contracts for buildings constructed along the highway. State law requires separate bids for plumbing, heating and electrical work for state buildings construction. Justice Coon said, however, that ". . . if it be desirable to extend the law to the Thruway Authority, it is a matter for legislative consideration."

DOCTORS RE-APPROVE FLUORIDATION—The governing body of the American Medical Association last week voted that fluoridation of public water supplies was "not harmful to the general health" of the population. This constituted complete approval of fluoridation by AMA, compared to a qualified stand taken in 1951 to the effect that the association "believed" fluoridated water was safe. The current affirmation came as a result of a re-study of the question ordered a year ago.

ASWAN HIGH DAM ON AGAIN—Egypt has announced that it will announce, near the end of 1958, international bidding to undertake the first construction phase of Aswan High Dam. Half of the necessary $370 million is to come from the nationalized Suez Canal Authority, and the remainder, President Nasser has said, "Egypt will provide out of its own resources." The Arab nation appears to be serious about Aswan, as indicated by its recent lifting of ban on collaborating with the British engineering firm of Sir Alexander Gibb.

EXIT THE RAIN CHECK—It looks like the day of rained-out summer concerts is coming to an end in Pittsburgh. The Pittsburgh Auditorium Authority is advertising this week for sealed bids to be opened February 12 for construction of a $16½ million to $17 million public auditorium with a retractable roof. Eight separate contracts will include one for construction of a metal dome divided radially into movable leaves. Pivoted at the crown and mounted on rails around the base, the leaves will roll into stacked position, exposing three-fourths of the arena to the open sky. Designers of the roof are Ammann & Whitney, New York consulting engineers. Architects for the project are Mitchell & Ritchey, Pittsburgh.

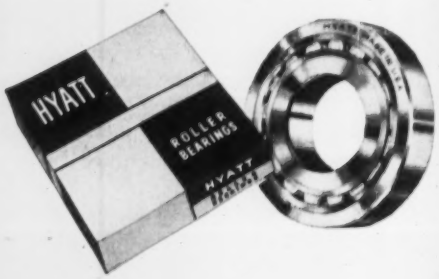
Why it pays to specify HYATT for replacement:

SUPERIOR QUALITY OF INNER RACES

The function of an inner race is to provide a fatigue-resistant surface between shaft and bearing rollers, and it is vital to good bearing performance that the inner race does not work loose on the shaft. Because of the smaller area of contact between inner races and rollers, as opposed to outer races and rollers, there is a heavier concentrated load on the inner race, *making it the critical bearing member from the fatigue life standpoint.*

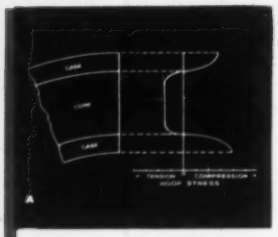
HYATT inner races are designed for relatively heavy press fits, so the inner race becomes an integral part of the shaft for all practical purposes. Other advantages of HYATT'S carburizing process and precision-finishing operations are briefly explained at right.

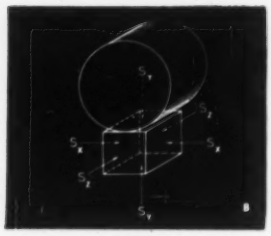
Be sure you get genuine HYATT Hy-Roll Bearings from your industrial bearings distributor. Then you're sure of *the lowest bearing cost per hour of service.* Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



SEE YOUR INDUSTRIAL BEARINGS DISTRIBUTOR

GM PARTS SALES

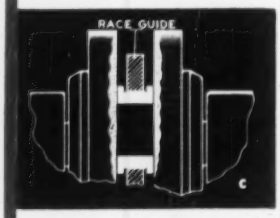


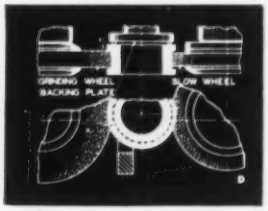


1. WHY CARBURIZING?

Carburizing provides inner races with tough cores, and flanges that will not crack, with no loss of case hardness. This permits tight press fits and also improves load-carrying capacity as shown in Diagram A. During quenching, a volumetric change tends to stretch the core and compress the case. Due to the Poisson effect, the compressive hoop stresses in the external fibres build up the load-carrying capacity.

Diagram B shows a typical element under roller load. Stresses in the "Z" direction are negligible; those in the "X" direction are compressive hoop stresses or pre-load. Those in the "Y" direction are compressive stresses due to the load. Without the compressive stress Sx (hoop stress) the load capacity would be reduced; and if "X" were a tensile stress due to pressing a through-hardened race on a shaft, the bearing capacity would be still less.



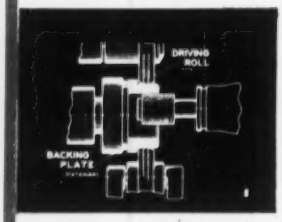


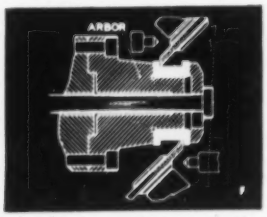
2. DOUBLE END GRIND

In grinding a HYATT inner race, the ends are first faced off square and parallel so they can be used as accurate reference during subsequent operations. The HYATT double end grind process (Diagram C) insures excellent control of parallelism.

3. CENTERLESS PATHWAY GRIND

Centerless grinding was pioneered by HYATT years ago, and eliminates excessive wall variation due to spindle and chucking errors. This method produces as nearly a perfect cylinder as is commercially practical. Two-point and three-point out of round and taper are held to a minimum. Note how work is rotated with backing plate against previously ground end (Diagram D) to insure accuracy.





4. CHUCKLESS BORE GRIND

Here the centerless method assures a bore concentric with the pathway, with minimum wall variation, by removing stock from high spots as they pass between drive roll and related grinding wheel (Diagram E).

5. FLANGE GRINDING

To assure that they will run true with roller pathway, flange faces are also ground using the squared ends for reference (Diagram F). This establishes even contact with roller ends during bearing operation.

HYATT HY-ROLL BEARINGS FOR REPLACEMENT

WASHINGTON OBSERVER

- States seek federal programs
- Utilities fight REA expansion
- Pay raises for government engineers
- Seaton firm on Glen Canyon water

● **First recommendations on turning tax revenues and public works construction back to the states have been made.** The committee of federal and state officials appointed by President Eisenhower has come up with two suggestions in its first official report:

Grants for pollution control and loans for urban renewal planning now made by federal agencies would be turned over to state authorities. To finance these, the federal government would relinquish its tax on local phone calls, let states collect such a tax. Amount of revenue—and hence spending—involved is around $150 million per year.

Repair of public facilities damaged in a disaster would also be done by states under the recommendations—the kind of thing the Army Engineers now do.

Odds are against legislation out of the upcoming Congress. There'll be strong opposition from present beneficiaries who feel they might lose if the federal government steps out.

● **Administration policy on Rural Electrification Administration expansion is coming to a test.** There has been growing resentment from private utilities that the government supported co-ops are becoming industrial giants. These objectors want the co-ops cut back to serving farmers—not industrial and suburban markets.

The Hoosier Energy Co-operative, Inc., of Indiana is the test case. Hoosier wants a 2% $42-million loan from REA to build a steam plant to serve a proposed aluminum reduction plant, as well as co-op distributors. This week, Hoosier was considering a new application, increasing the size of the loan request.

REA Administrator David Hamil is under the gun. His own Department of Agriculture superiors are now reviewing all loan applications of more than $500,000.

● **Sputnik-inspired pay raises for 45,000 government engineers and scientists will boost each employee to the top pay permitted by his grade.** The increases—ranging from $125 to $1,000 per year—are being ordered by the Civil Service Commission without having legislation from Congress.

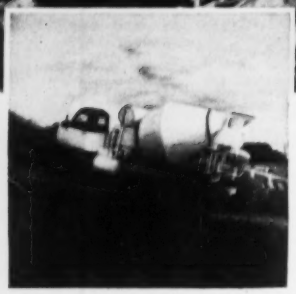
On the bandwagon are half a dozen agencies including Navy, National Bureau of Standards, the National Advisory Committee for Aeronautics, the Air Force, Army Engineers and the Defense Department.

Such increases within present scales and grades do not affect plans being lined up for legislation next year which would adjust pay scales of scientists and engineers upward.

● **Operating schedule of Upper Colorado's Glen Canyon Dam won't be changed to answer complaints of Lower Basin states.** Interior Secretary Seaton plans to send to Congress January 1 the tentative plan approved by the four Upper Basin states in Boulder City last week.

Arizona, Nevada, and California are concerned that too fast a filling of the reservoir means losses of secondary power. This means a financial loss to these states amounting to a million dollars a year; a California spokesman says they should be compensated for this.

Interior emphasizes that all this is very preliminary, that a final plan can't be made before the dam is completed, about 1965.



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CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Conflicts between the old AFL and CIO stalk the Boardwalk in Atlantic City as the AFL-CIO celebrates its second birthday. Deep differences exist on:

TEAMSTERS, whose expulsion is viewed by the building trades as a violation of due process of law and union autonomy.

JURISDICTION, between craft and industrial unions, which adds up to a bread and butter issue for construction trades.

INFLATION which President Gray would combat by a wage freeze, President Meany (*right*) by wage boosts.

Chips are down, an uneasy peace remains →

The AFL-CIO Spans the Chinks in Unity

Charles J. Harding
Associate Editor

In a dramatic session of its Second Constitutional Convention, the AFL-CIO last week stood fast in its determination to drive corruption from the ranks of labor and expelled the International Brotherhood of Teamsters from the united labor movement.

The action occurred on Friday in Atlantic City's huge Convention Hall and represented the first big test of the aims and purposes of labor unity since the merger of the AFL and the CIO two years ago.

It set the stage for action this week on two more controversial issues—jurisdiction and inflation. Out of it all is expected to come a challenge to industry as well as labor to set its houses in order and to cooperate unselfishly with labor in a joint effort to promote the welfare of the public.

Before the AFL-CIO delegates moved into Conventional Hall, the AFL-CIO Building and Construction Trades Department had completed its golden anniversary convention in the Shelburne Hotel a few blocks up the windswept Boardwalk. And by week's end these major developments had emerged from the two conventions:

• Indications came from the teamsters union, from parts of the building trades and from leaders of the AFL-CIO that expulsion of the federation's largest union would not lead to civil war within the ranks of labor nor trigger off any immediate disruption of inter-union relationships.

• The building trades unions, which claim that industrial unions are stealing the jobs of both contractors and construction workers, voted down resolutions to secede from the united labor movement and tried to force the AFL-CIO to put the explosive issue of union work jurisdiction on the federation's convention floor.

• Building trades' President Richard J. Gray proposed, as a labor contribution to the nation's fight against inflation, a one-year, voluntary moratorium on wage increases for construction workers and drew both contractors and the AFL-CIO into a ticklish debate on national economy and economic policy.

Teamsters

At the building trades convention, President Gray urged the 19 international building trades unions to oppose teamster expulsion for two reasons. Although condemning corruption wherever it occurs, he said that charges against the teamsters, who have been denied a fair trial or due process of law, have not been proven and that labor's major objective should not be destruction of unity but organization of the unorganized.

When the issue reached the convention floor, these views—together with a reaffirmation of the principles of union autonomy and voluntarism—were incorporated in a unanimously adopted resolution against expulsion.

Said one building tradesman to his fellow delegates: "Expulsion of the teamsters would be the beginning of our downfall, and I call this simply a Reutherized process by Meany."

Meanwhile, AFL-CIO President Meany was laying the psychological foundation for expulsion that later occurred by an AFL-CIO vote of 8,454,489 to 4,227,244. Throughout a tense week he stressed three points:

• Organized labor must protect at all costs the interests of every rank and file union member.

• No compromise with evil. On this point there must be labor unity.

• Only through action unselfishly dedicated to honesty and decency can the labor movement command the respect of the nation, avoid oppressive

. . . AFL-CIO unity put to test

PRESIDENT RICHARD GRAY leads the building trades in industrial union fight.

CONVENTION OF AFL-CIO Building and Construction Trades Department marks group's golden anniversary. Sole survivor of department founders is President-Emeritus

legislation (see page 146) and serve the interests of the public.

When the showdown came, only six of the building trades supported the teamsters—carpenters, elevator constructors, laborers, lathers, sheet metal workers and stone cutters.

Even this support was enough to underscore the prevailing sentiment of the building trades not to disturb their existing relationships with the teamsters. Except for a mutual assistance pact for organizational purposes in the heavy and highway construction fields between teamsters, carpenters, operating engineers and laborers, those decisions will be made primarily at the local level.

In support of this sentiment, the teamsters have publicly declared: "We will continue to work with other unions. We will not raid. We will not wreck. We will not seek to destroy. . . . We will never be the first to withdraw from any (of our mutual aid) agreements."

Continuance of such agreements is not forbidden by the AFL-CIO constitution. The acid test is whether an affiliate, through cooperation with the teamsters, becomes "dominated, controlled or substantially influenced" by corrupt elements.

In the departmental picture, Dave Beck resigned last week as a vice president of the Building and Construction Trades Department. His successor was not a teamster.

And on the AFL-CIO front, President Meany has left the door open for a return of the teamsters if they free themselves from the control of James Hoffa and consent to a house-cleaning under federation supervision. Meanwhile, no rival union will be chartered and no immediate steps will be taken to force the ultimately necessary steps in the recomposition of state and local bodies.

Jurisdiction

Another test of unity—and one more crucial for the construction industry—will be made in the weeks ahead on the question of work jurisdiction.

The basic issue is whether members of industrial unions (such as the auto and steelworkers unions) have any right to perform construction work in industrial plants and thus deprive contractors and construction workers of jobs.

Roots of the problem go back to the natural conflicts that flow from the two types of unionism embraced by the AFL-CIO: craft and industrial, or vertical and horizontal.

It was 22 years ago that a bitter fight within the ranks of the AFL over the two types of unionism spawned the birth of the CIO. Since then, the old wounds have never healed and the building trades—backbone of craft unionism—claim that industrial unions are gobbling up their jurisdiction and threatening them and their contractors with extinction (ENR Nov. 28, p. 87).

Since the merger, the conflict has reached the intensity of white heat. All efforts to resolve the issue have failed. Contractors across the nation have registered increasing concern.

Nineteen resolutions calling for unequivocal action—including secession from the AFL-CIO—were presented at the building trades convention. Their strongest support came from the grass roots unionists in New Jersey, Ohio, Michigan and California.

The fight to preserve the jurisdictional rights of the building trades was led by President Gray who is "wholeheartedly in favor of a united labor movement" but not if the "price" means giving up the building trades' "well recognized and chartered work jurisdiction."

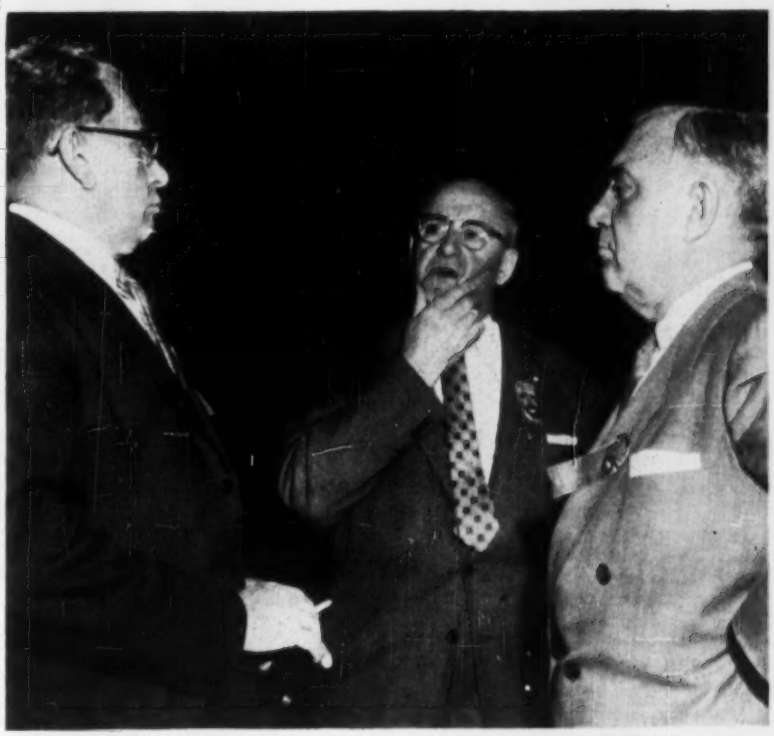
That jurisdiction, he declared, includes the right to perform all construction, alteration and repair work, including all maintenance work not of a "minor, routine, recurring" nature.

As a basis for settling the conflict, Mr. Gray called upon the AFL-CIO to recognize these rights and to ban industrial union use of labor contract clauses restricting the right of industrial management to contract out construction work.

Before a vote was taken on the resolutions, President Meany appeared at the building trades convention and made an eloquent plea for unity in the labor movement.

In urging the delegates to view the problem "realistically," he said that for 20 years craft and industrial unions have both engaged in indiscriminate or-

William J. McSorley (lathers) who takes a bow at the microphone.



CONVENTION TENSION is reflected by these labor leaders: M. A. Hutcheson (carpenters), Peter T. Schoemann (plumbers) and Joseph D. Keenan (electrical workers).

ganization on craft and industrial lines until there are now "more than 40 unions all criss-crossing, all over-lapping in all shapes and fashions." And much of the result, he said, stemmed from a failure of the building trades to organize industrial craftsmen before the CIO itself jumped in.

Asking if two years is too short a time to solve a problem so complex and one that's existed for 20 years, he warned that a labor war will never solve the problem and will merely benefit the "enemies of labor."

Final decision of the building trades was to make another effort to solve the conflict within the framework of labor unity.

By resolution, they called upon the AFL-CIO for a "guarantee" of the building trades' jurisdiction and a ban on industrial union efforts to "usurp" that jurisdiction through economic pressure, picket lines and collective bargaining contracts.

Thus the issue is drawn. But the AFL-CIO this week refused to air the feud on the convention floor. Instead, the issue will go before the Executive Council at its midwinter meeting in February. If the building trades do not get what they've asked for by February 28, their general presidents have been instructed to meet "to make a final decision on the future steps to be taken."

Inflation

Of keener interest to the public is a voluntary wage-freeze proposal presented by President Gray.

He proposed that construction workers voluntarily forego wage increases during 1958. The proposal does not apply to automatic pay hikes under existing long-term labor contracts and will be presented to the department's Executive Council at its regular quarterly meeting in Miami next month.

Coupled with this proposal is a recommendation that a national labor-management committee, representing the construction industry, money lenders, and the White House, be formed to develop ways and means of cutting construction costs and expanding construction markets.

Mr. Gray said his proposals are based on these personal convictions: Inflation creates a shortage of money, cutbacks in construction and unemployment for construction workers. All adversely affect the national economy. The construction industry should recognize its responsibility to the nation and attempt to solve the problem through free enterprise. Present stabilization of wage gains will promote fuller employment through increased construction. Failure to check inflation will produce higher wages, higher prices, less construction with more unemployment, and eventual government wage and price controls.

Spokesmen for four contractor associations—Associated General Contractors, National Constructors Association, Council of Mechanical Specialty Contracting Industries, and National Association of Home Builders—later addressed the convention. None directly discussed the Gray proposal but all agreed that joint labor-management efforts must be made to prevent the construction industry from pricing itself out of a market. Since then, the AGC and NAHB have urged the building trades to formulate a concrete program. But contractors have said little about how far they might go to match the sacrifices Mr. Gray proposed.

President Meany, however, was quick to denounce the Gray proposal. He said the nation now faces not an "inflationary situation" but an "economic downturn" for which the cure is an increase in consumer purchasing power, not a lid on wages. "There is no reason to conclude that a wage freeze at this time would be advantageous to anyone but the employers," he declared.

Meanwhile, the wage-freeze proposal has found little public support among the building trades. Mr. Gray said he did not expect that it would at this time and expressed the hope that its broad implications would be studied carefully between now and the Executive Board meeting.

Engineering With Adhesives

Adhesives and sealants assume key importance in new construction, panel of experts tells BRI meeting

The new role for adhesives and sealants in building construction was the subject of a two-day conference conducted by the Building Research Institute in Washington, D. C., last week. More than 500 representatives of the building and chemical industries attended.

"From the relatively minor role played by glue and putty not so many years ago, engineering adhesives and sealants have developed into constituents of key importance in building," said Albert G. H. Dietz, professor of building engineering and construction, Massachusetts Institute of Technology, the keynote speaker.

Thin curtain walls, made of large-size panels, often of sandwich construction, impose requirements on sealants and adhesives far in excess of the demands placed on putties and cement in traditional buildings, said Mr. Dietz. So too, does the strong trend toward component construction (based on the idea of assembling non-standardized buildings with large standardized units), because the components must be put together with weathertight joints, and many components rely on adhesives for strength and stiffness.

Adhesive bonds more and more frequently are being favored over conventional means of fastening materials, the panelists pointed out. One big advantage is that adhesive-bonded connections are more rigid; a continuous bond is achieved, whereas connections with conventional fasteners are discontinuous.

Weight saving was cited as another advantageous factor. For example, glued laminated trusses and beams have less weight for the same strength than similar wood construction with bolted joints.

In certain instances, adhesives may be the most practical means of fastening certain materials. Thin materials, such as sheet metal, that are difficult to fasten with rivets or spot welds are well suited for adhesives, said G. W. Koehn, of Armstrong Cork Co. The elasticity of an adhesive is of particular advantage in binding together dissimilar materials that exhibit different coefficients of expansion and growth characteristics.

• **Proper application necessary**—One of the major drawbacks with adhesive bonds is that they have failed when improperly used and applied. Causes of failure were attributed to (1) misapplication (i.e. selecting the wrong adhesive), resulting in inadequate strength, lack of durability or unfavorable reactions between contiguous materials; and (2) misuse of the material during bonding, such as inadequate surface preparation of the area to be bonded, because of using too much or too little adhesive, allowing insufficient drying time, misapplication of pressure, or lack of adequate pressure.

To obtain maximum benefits from adhesives, considerations should be given to the effects of the following in selection and use: strength requirements, cyclic conditions, temperature, water, humidity, aging, alkalis aging, chemical actions between adhesives and materials being glued.

• **A look ahead**—Tapes for building panels, a new means of sealing and joining, were discussed by Paul H. Wilson, supervisor, construction projects, Minnesota Mining and Manufacturing Co. Temporary application tapes have been known for years, but permanent and stable type of tapes have now been developed. Tape applications to panel joints have thus far been largely experimental, but they promise substantial cost savings to the building industry, Mr. Wilson stated.

A number of basic problems involving sealants and adhesives remain to be solved before they can be utilized with maximum effectiveness, panelists concurred. A better understanding of the complex mechanisms involved in adhesion is needed. Non-destructive means of evaluating the quality of a bond; and means of predicting long-term durability from short-term tests—particularly when materials are exposed to severe weather conditions—require further development. Improvements can be made in methods of applying adhesives and in simplifying the bonding process.

Eventually, predicted Mr. Koehn, "making an adhesive bond will be no more difficult than driving a nail."

Consultant Gets New Penn Pike Agreement

The Pennsylvania Turnpike Commission has entered into a new contract for consulting engineering services with Michael Baker, Inc., Rochester, Pa., calling for the handling of all pike engineering problems for a flat fee of $10,000 a month.

Commission attorneys said that the contract replaces a previous agreement under which Baker's engineering fee would have jumped to $25,000 a month on Nov. 7, with the opening of the final section of the Northeastern Extension to Scranton.

Previous payments reportedly have been running $8,000 to $8,500 a month. Under the new contract—cancelable by either party on 90 days notice—Baker agrees to keep a minimum staff of five employees at the Commission's headquarters. At present the firm has eight engineers doing turnpike duty.

Ohio Board Cracks Down on Inadequate Sewage Plants

The Ohio Water Pollution Control Board has ordered a halt to extension of sewage collection systems by municipalities that lack adequate facilities for treatment of sewage already being collected.

F. H. Waring, state sanitary engineer, said a dozen northeastern Ohio communities—including Niles and a group of cities surrounding Cleveland—will be affected immediately.

The board said 141 small communities have been granted exemptions and have been permitted to operate disposal systems that do not meet full approval. Members said construction of adequate disposal systems would work a financial hardship on the towns.

Big Break in Seattle Sewer Is Bypassed

A mile-long temporary bypass sewer around a caved-in 72 in. trunk sewer in Seattle, Wash., (ENR Nov. 21, p. 15) has been placed in service.

Meanwhile, the large hole above the 145 ft deep trunk sewer 100 by 200 ft by 60 ft deep is being filled. Requiring an estimated 24,000 cu yd of material, the fill is expected to be completed shortly. Gravel is being barged to a site on the Lake Washington Ship Canal several miles from the big hole, then trucked to the spot and placed by a conveyor system.

To keep the cave-in from enlarging and dragging down a dozen adjacent homes, a large hole was drilled into the trunk line pipe just above the break. Cement grout was then pumped into the line to seal it and prevent water from flowing into the broken section and the hole.

After completion of the fill, the city will seek to locate the exact spot of the break, ascertain the amount of damage and make the necessary repairs, a project expected to require several months. The bypass sewer, of 42 and 48 in. steel pipe, is expected to be able to carry the flow around the break except in case of very severe storm conditions. If repairs of the main sewer prove too costly, this bypass may be made permanent.

Night Shift at Noxon Rapids

A round-the-clock operation at Noxon Rapids Dam construction site is shown as a time exposure. Lights on boom of whirler crane form the semicircles of light. In the foreground is the powerhouse construction area; spillway section is shown in background. Picture was taken from south shore of Clark Fork River in western Montana at site of Washington Water Power Co.'s hydroelectric project that will produce 400,000 kw and double the firm's present generating capability. Construction work is being done by Morrison-Knudsen Co., Inc., of Boise, Idaho. M-K holds $20 million prime contract. Total cost of dam is about $87 million.

New Kind of Overpass

Diners at a new $1.4 million restaurant at Vinita, Okla., will sit directly above traffic on four-lane Will Rogers Turnpike. Prestressed concrete floor beams span 100 ft across the road. Reinforced concrete arches support the roof. Hudgins, Thompson & Ball designed the building and Lippert Bros. built it.

Down to the Sea — To Dredge Deep

One of the world's most powerful cutterhead dredges will be Utah Construction Co.'s 2,800 ton "Alameda," launched last week by Pacific Coast Engineering Co. The $3.6 million vessel is designed to move more than 40,000 cu yd of material a day over distances topping 4 miles; has an overall length of 208 ft, a width of 50 ft, and will draw 14 ft of water. A 78-ft-long ladder, carrying an 18 ton, 9 ft dia cutter head, will permit the dredge to work in water depths up to 52 ft. A 36 in. suction pump, powered by an 8,000 hp electric motor, will move materials from the ad through discharge pipes.

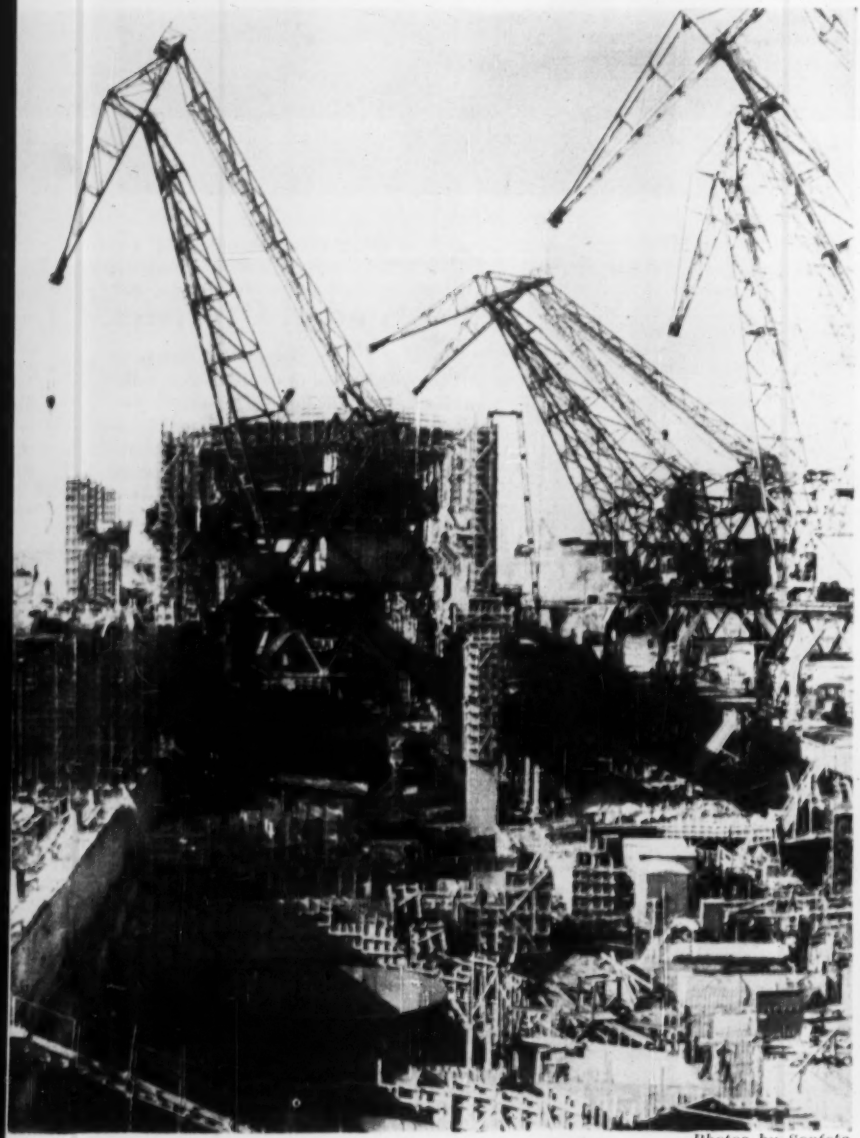
Huge Soviet projects like these are being offered as a big reason for expanding U.S. public works rather than cutting them as a result of Sputnik-inspired defense speedups

Soviet Hydro

Current Russian hydro jobs shown here are convincing proof that the Soviets are embarked on a river development program of mammoth proportions. This, and other, evidence of Russian water resources progress was picked up by U.S. public works advocates last week in a campaign against cuts by Congress next year.

Pressure for reductions in public works spending has been mounting as a result of Sputnik's effect of increasing the level of defense expenditures.

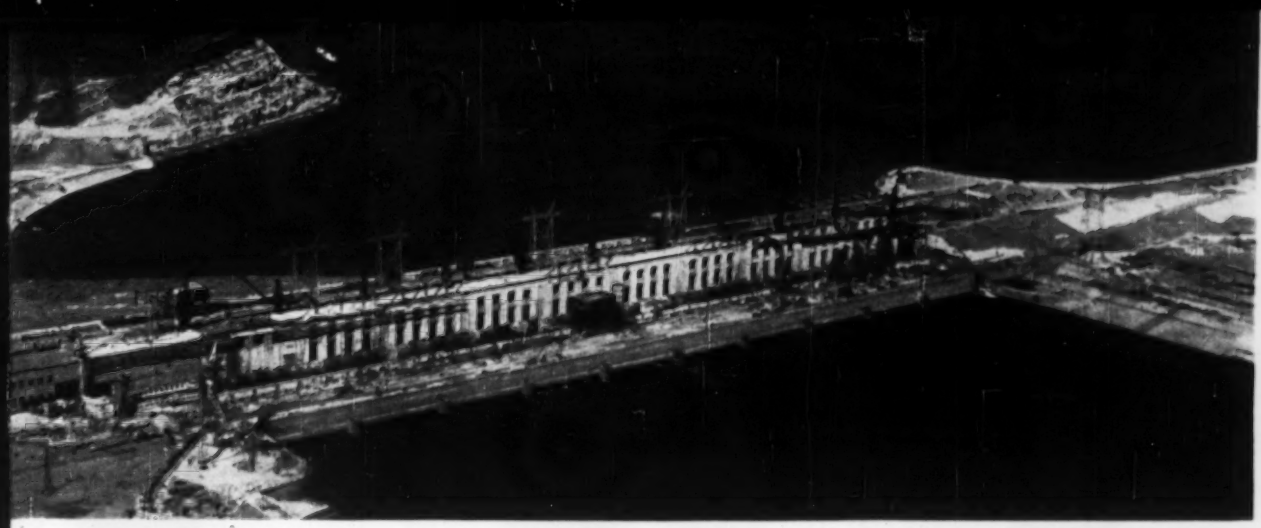
Corps of Engineers Chief Maj. Gen. E. C. Itschner, in a speech before the Mississippi Valley Flood Control Association, painted a rosy picture of Russian river work since World War II: 3,000 miles of integrated inland water-



Photos by Sovfoto

STALINGRAD on the Volga will be world's largest plant with 2.3 million kw of capacity. Operation is scheduled in 1958. Powerhouse foundation is shown under construction.

BRATSK STATION in central Siberia is to have world's largest capacity and record-



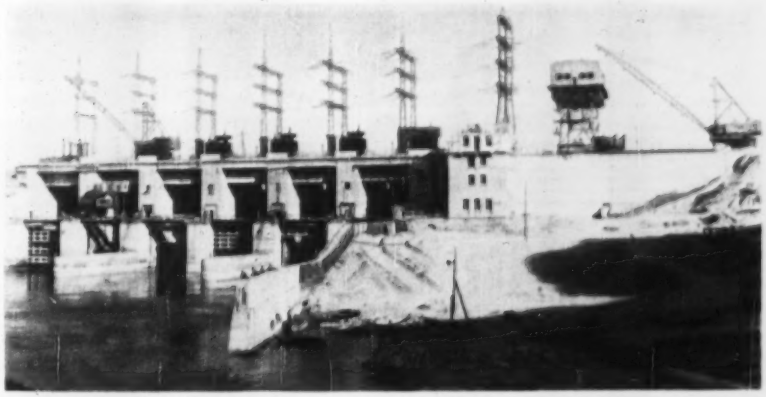
KUIBYSHEV POWERHOUSE recently went into full operation, making it the largest completed hydro installation in the world with 2.1 million kw capacity from 20 units. Building is 2,300 ft long. Concrete spillway dam (off right) extends 3,200 ft across Volga. Earth dams on higher ground total 9,200 ft in length. Maximum gross head driving Kaplan turbines is 98 ft.

Spurs U. S. Public Works Money Push

ways, world's largest hydro plants, effective flood plain zoning. He warned that a strong national economy is essential to national defense and river work is an essential ingredient of a strong economy.

William H. Webb, head of the National Rivers and Harbors Congress, in a memorandum to members, said Russia "is pushing ahead with long-term plans."

Coming up to bat soon is former Reclamation Commissioner Mike Strauss who, in a special report to the Senate Interior Committee after January 1, is expected to say that the Russians are ahead, or at least abreast, of the U.S. in the utilization of water resources.



NOVOSIBIRSK POWERHOUSE, on Ob River, went on line in November with one unit. Note the unusual design of whirler cranes here and in Stalingrad photo at left.

size turbines, 3.6 million kw and 200,000 hp, respectively. Work is in very early stage.

KAIRAK-KUM STATION on the Syr-Darya River is to be commissioned shortly. Note Soviet use of large precast concrete panels for pier and block facing.

City Expressways

Drive continues in U. S. for traffic jam solution

The clamor for municipal expressways to alleviate traffic congestion in major U.S. cities grew stronger last week, as cities continued to recognize growing congestion at points where major interstate highway have been developed and improved. Added use of these routes has caused bottlenecks and congestion where they suddenly come to an end.

Three major cities are tackling the problem:

In Philadelphia, a group headed by the mayor recently discussed the city's traffic problems with officials of the Pennsylvania Department of Highways and the U.S. Bureau of Public Roads in an effort to clarify local problems and state needs in terms of expressways. Four new connecting expressways were recommended by the mayor's group, which stressed the fact that the expressways were a vital part of the central Philadelphia redevelopment plans.

One expressway the group does not want—at least not until the Pennsylvania Turnpike becomes toll-free—is the proposed Keystone Shortway, a cross-state route paralleling the turnpike further north. The group feels that such a toll road might act to funnel commerce into New York instead of into Philadelphia, and also might jeopardize the turnpike's bonds' credit.

The group made other recommendations of a more general nature: a traffic study between Philadelphia and Camden, N. J., streamlined legislation to facilitate roadbuilding, and some action to permit weekend work by contractors on roads under construction.

In Detroit, a 10 year expressway construction program to cost $632 million was revealed. Included in the proposal would be some 81 miles of expressway to funnel major highway route traffic into downtown Detroit, connect major expressways with city arterial routes, and better serve suburban areas through by-passing the metropolitan district. John C. Mackie, Michigan State Highway Commissioner, claims that the new network will give Detroit facilities unequalled by any other city in the world.

In St. Louis, plans for a 3 mi stretch of expressway to pass through the downtown area were approved by the Missouri Highway Commission. In conjunction with extensions to existing freeways, the $22 million project will serve to divert traffic from the congested downtown area by affording a circumferential route around it.

And in Columbus, Ohio, city, state and federal officials are considering a report recommending a 47.3 mi, $92 million outer belt expressway route around the major part of the city's area. It is hoped that the project would be considered a part of the federal interstate highway system and thus be eligible for 90% U.S. aid. The state would pay 5% of the remaining cost, and the city the other 5%.

Recommended by the engineering firms of DeLeuw, Cather & Brill of New York City, the route would have 21 interchanges and should have sufficient land for expansion from a planned 4 lane to a 6 lane highway. Plans call for 78 grade separation projects, 13 railroad grades and seven structures over streams.

WAVE TANK dedicated during international beach erosion conference, was one point of interest for experts who made extensive tour of Florida beaches to study erosion problems.

Trends in Beach Protection

The Sixth International Conference on Coastal Engineering, held at the University of Florida last week, had as one of its high points dedication of the university's wave tank. This major research tool in the fight against beach erosion was designed and built by the Coastal Engineering Laboratory of the university's Engineering and Industrial Experiment Station.

The 150 beach erosion engineering experts who had gathered from all over the world at the invitation of the conference sponsors—the U.S. Council on Wave Research and the experiment station—were shown a tank that consists of a channel 6 ft wide, 4 ft deep and 132 ft long, and a diffraction basin 18 by 25 ft; making a total length of 150 ft.

In this tank, waves can be generated by movement of a bulkhead at one end; wind waves also can be generated by means of a blower. The tank is extensively fitted for observation and recording of the wide ranges of waves that can be induced within it. A 20 hp blower can generate wind velocities up to 60 ft per sec over the water, while the bulkhead, powered by a 40 hp hydraulic pump, can provide frequencies of 0.2 cps at its maximum stroke of 28 in.

• **Trends in protection**—Papers delivered at the five-day conference covered all phases of the problem. And a summary of the trend in engineering of shore protection in the U.S. was given by R. O. Eaton, chief technical advisor, U. S. Beach Erosion Board. He pointed out that:

• Design by analogy is decreasing and the selection of protection method based on thorough analysis of basic causes is now customary.

• Organized planning and financing of shore-protection measures by community, state and federal levels of government is now the policy in 10 of the 28 coastal states, including those bordering on the Great Lakes.

• Greater competence in problem analysis has made possible the comparison of costs per year per foot of shore for different methods. This has led to greatly increased use of beach fills (nourishment of eroding beaches).

• Defensive or stabilizing works such as seawalls or groins are still used where they are economically advantageous or when organized effort to attack an erosion problem is still lacking.

• Sand by-passing at coastal inlets as a means of providing beach nourishment, while still in its infancy, is likely to be widely applied in the future.

Mr. Eaton closed his remarks by noting the principal advance in the last two decades is the decision of the majority of coastal engineers to work with rather than oppose the forces of nature.

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*Patent applied for.

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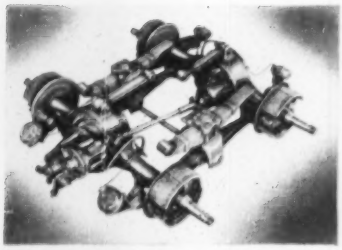
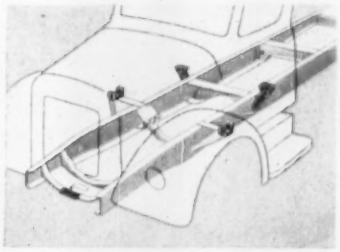
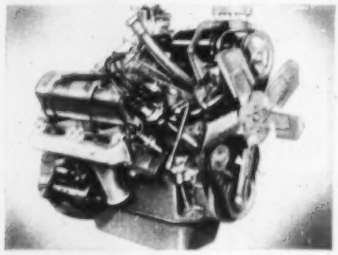


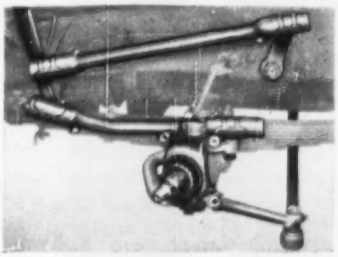
Pull through rugged off-highway terrain. Sturdy, long lasting tandem has extra flotation, positive traction always.



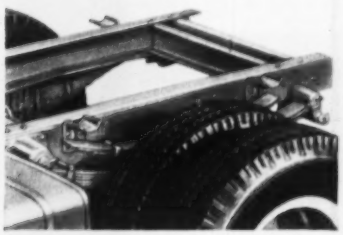
Cabs last longer even in the most severe operations with exclusive 5-point mountings. Quieter, easier riding.



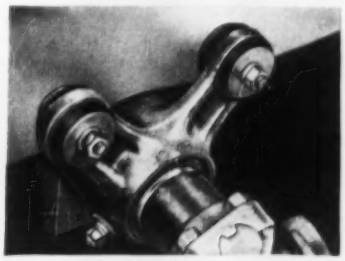
Save time, save money with the most powerful V-8's you can get—to 257 hp. Other power plants up to 356 hp.



Easy to handle even in tightest spots with true geometric steering, cam and roller-mounted steering gears.



Plenty of strength for toughest jobs, biggest loads with frames that have extra rigidity and proper flexibility.



End service costs and maintenance with rubber mounted, sealed and shielded "silent spin" center bearings.

Tough off-highway construction jobs require tandems and all other parts that are built to stand up and take it . . . that will keep operation and maintenance costs 'way down.

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**Signed statements in our files from fleet operators throughout the U. S., back up this statement.*

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INTERNATIONAL TRUCKS cost least to own!

Engineer Shortage

Demand to exceed supply through 1960, report says

The engineer shortage will extend through 1960. Demand for engineers—averaging 46,000 a year so far in this decade—should increase through the next three years. And the increasing supply won't meet demand.

These are conclusions of a research report by Deutsch & Shea, Inc., the technical manpower consultants whose recently published "Profile of an Engineer" was reported in ENR Sept. 19, p. 23.

One reason for prolonged engineer shortage, says the new report (titled, "The Supply and Demand of Engineers 1950-1960"), is the time lag between a change in market conditions and general realization of such change. While engineer shortages began immediately after the Korean War, student enrollments didn't pick up until 1953; graduating classes continued to reflect market conditions of the late forties, according to the report.

This research report concerns itself specifically with the several major branches of engineering as well as with the profession as a whole.

It states that from 1950 to 1957 some 204,800 engineering college graduates entered the field. In addition, some 22,000 non-engineering college graduates and 79,400 non-graduates joined ranks of the engineering field. And 15,400 former engineers returned to the fold.

The total entrants thus was 321,600 over a seven year period.

Losses due to deaths, retirement or transfer to other fields totaled 84,000.

Total number in engineering in April, 1957, was therefore 771,600, according to the report. This number will be disputed by those qualifying who is an engineer more strictly than have these researchers. They have used Census Bureau figures, which in 1950 had college graduates making up only 54.5% of all who classified themselves as engineers. In 1957, college graduates still constituted less than 65% of the total engineer labor force, report the researchers.

Concerning salary growth as an indicator of shortage, this report adds a refutation of the findings of Blank and Stigler (ENR July 25, p. 66) that engineer earnings haven't indicated engineer shortage:

"From 1950 to 1957 engineers' starting salaries increased more than four times as much as the cost of living, and significantly more than the average salaries of other workers. These facts point to the existence of shortage," concludes this report.

Civil engineers are found to work 71.6% in non-manufacturing industry (48% of all civils are in construction); 17.9% in government; 9.2% in manufacturing; 1.3% in education. In total numbers, CE's dropped from first to third place (behind mechanicals and electricals) between 1950 and 1957.

However, the report points out that the demand-supply gap in civil engineering for the 1950-1957 period was not nearly so great in civil engineering as in other, rapidly expanding fields. This substantiates findings of ENR's special report on the shortage published a year ago (ENR Nov. 8, 1956, p. 28).

For the future, the report predicts: 153,800 will enter the engineering labor force in the next three years, about 19% of them non-graduates. This will put 877,100 in the field in 1960.

And as for future demand: If the level of expenditures holds up (mainly in research and development) average yearly demand through 1960 will exceed the 46,000 figure for the last seven years.

The Deutsch & Shea report is available through INDUSTRIAL RELATIONS NEWS, 230 West 41 St., New York 36, N. Y., at a price of $3.00 per copy.

Engineers Are Ordered to Use Electronic Computer

Minnesota state highway engineers have been ordered to "make full use" of the department's electronic computer.

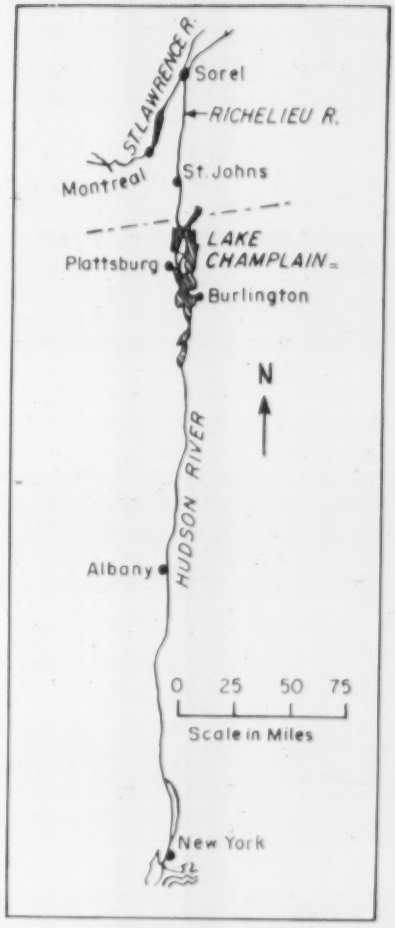
"We've been having some trouble working electronic computation into our pattern—trouble of a type which might be attributed to human inertia," Frank Marzitelli, deputy state highway commissioner, said.

When the machine first went into operation, he stated, engineers were not ordered to use it, on the assumption they voluntarily would supply more work than the machine could handle during the period when the machine crew was learning how to operate it.

"It didn't work out that way, however," the deputy commissioner went on. "Many engineers looked on the machine as a piece of equipment which might disturb their continuity of employment. As a result, the machine has been running at only 50% of capacity.

"The fear has now been dispelled," Mr. Mariztelli said. "The reluctant engineers now recognize there is more work than possibly can be handled by the old methods—and henceforth use of the machine will be mandatory."

The Minnesota Highway Department is one of the few engineering agencies that have had to resort to such formal methods of getting electronic computers into widespread use. Most other agencies using computers are accomplishing the trick by a lot of "selling," and subtle pressure from the top.



New York-St. Lawrence Route May Be Deepened

The St. Lawrence Seaway has engendered another byproduct project possibility: Deepening the draft on the Hudson River-Richelieu River waterway between New York City and the St. Lawrence River at Sorel, just above Montreal.

Except for a 12 mile stretch of canal along the Richelieu in Canada, the entire route can take vessels up to 12 ft draft. This canal, part of the over 100 year old Chambly Canal, system, has a navigation depth of only 6½ ft.

The current talk revolves around deepening this stretch to 12 ft draft at an estimated cost of $12 million. At a recent meeting in Sorel, attended by Gov. Joseph B. Johnson of Vermont and Col. J. R. Dansereau, Canadian member of the International Joint Commission, it was urged that the Canadian government re-survey the bottleneck section.

The Hudson River-Richelieu River route extends only 452 miles between Montreal and New York City, compared with 1,670 miles by open sea and the St. Lawrence River. At present, only one shipping company regularly uses the inland waterway.

Iraq's Operation Bootstrap — *Part One*

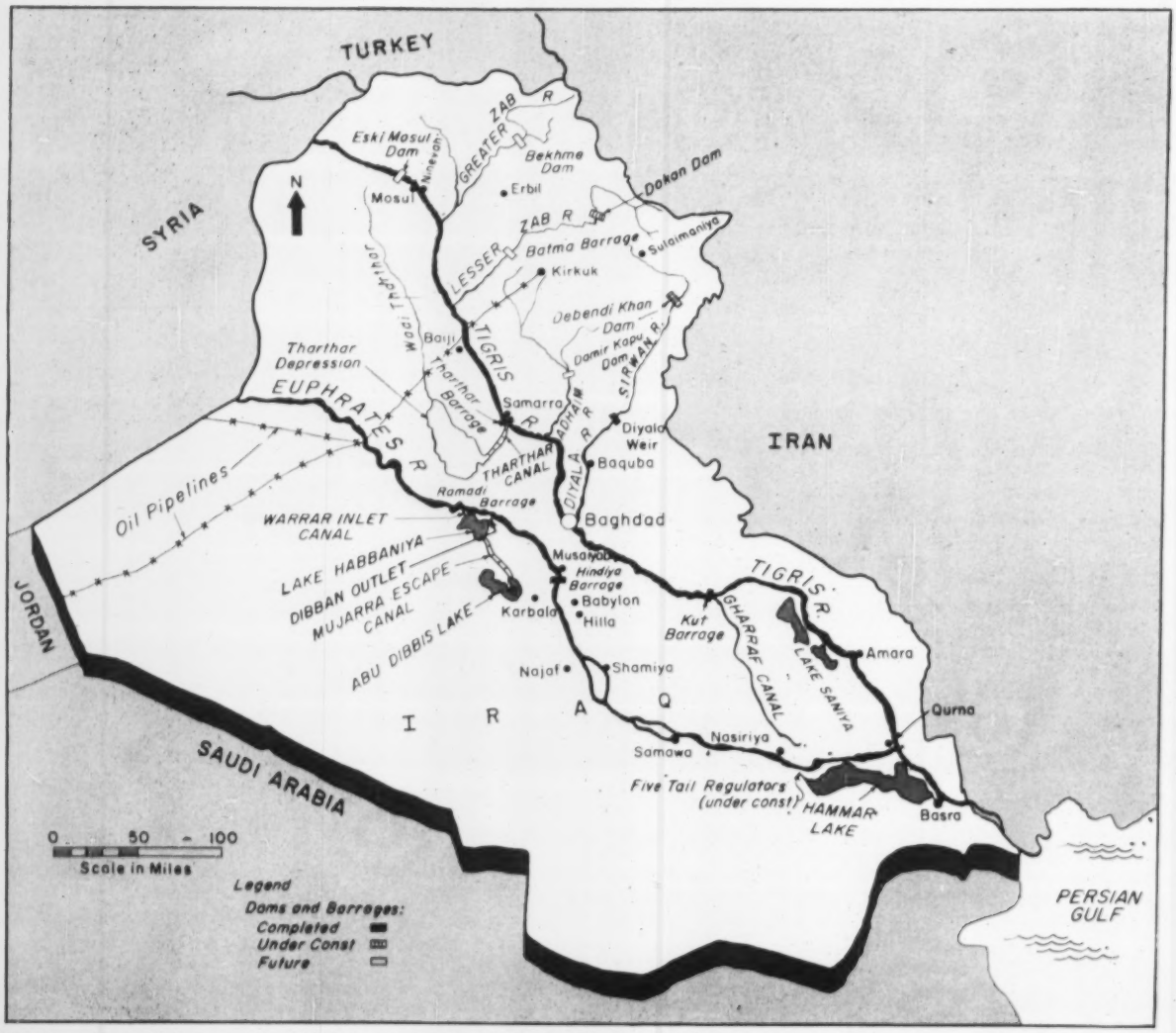
A Modern Mesopotamia

By plowing the bulk of its income into facilities to tame its rivers, water its farms, employ its workers and house its people, Iraq seeks a quick getaway from its primitive past. The gamble is big, but the chances for a handsome payoff in higher standards of living are good, and getting better. This is Part One of two-part coverage of Iraq's current development projects.

Waldo G. Bowman
Editor, Engineering News-Record

Iraq, our Baghdad Pact ally in the center of the Middle East, has military readiness as its watchword, but construction is its real and consuming interest. From the upland north to the flat, alluvial south, the entire half of this 172,000 sq mile country that is not unreclaimable desert is dotted with building projects in various stages. A few are finished, many more are just beginning, and, back in Baghdad, drawingboards are piled with enough new dream jobs to keep the development pot boiling for years to come.

All this can happen because almost three-quarters of the country's revenues and a comparable amount of the national energy are being devoted to the creation of facilities geared to furnish as near a modern living standard as possible for its five million people. The goal is to recreate in this ancient land of Mesopotamia—often called the cradle of civilization—some semblance of the economic wellbeing that it once had,



IRAQ must pin its hopes on its Twin Rivers. Dams for flood control and storage, followed by reclamation of its legendary Garden of Eden region are main objectives of its development program—a program including industry and housing, as well.

Is Molded

but lost and frittered away over the past 2,000 years.

Such a construction boom also can happen for another reason. Even while its well equipped army trains and maneuvers, and one set of high government officials trades diplomatic punches with Syria, Egypt and Comrade Khrushchev, another arm of government can devote its entire attention to the country's physical improvement. This arm, known as the Iraq Development Board, not only has its own law-protected income, but also the power to run its own affairs, since it numbers among its ten members the Prime Minister and the Ministers of Development and Finance. The program that it is carrying out touches every facet of national life—agriculture, industry, transportation, health, education and housing.

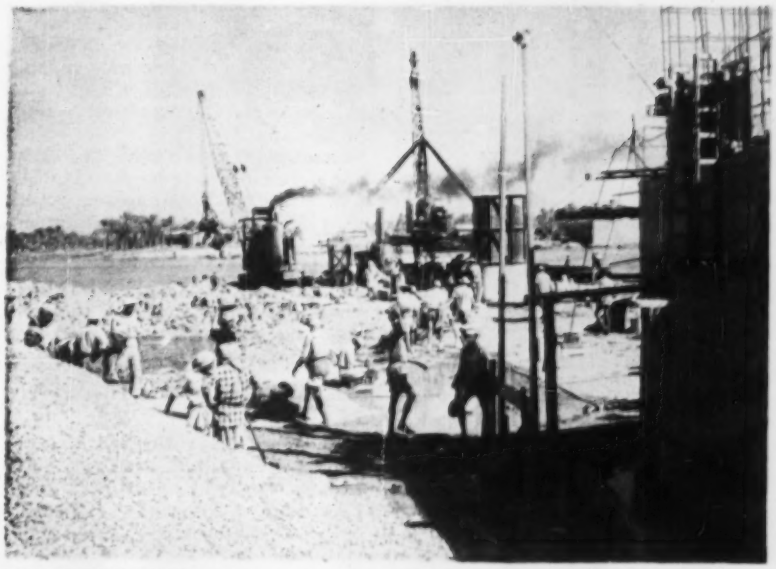
No similarly complete program for an underdeveloped country is under way anywhere else in the world. And in no other country are the ingredients for success as amply available. Iraq, alone among other Middle East countries with the possible exception of Turkey, has plenty of water. It has fertile land, and not too many people to occupy it. And to make the most of these assets, it has the money to pay for development, and a government disposed to use its funds wisely for the future of its people.

As a consequence, what is happening in Iraq should be known and appreciated by the U. S. construction industry. Particularly so, since a relatively large number of U. S. firms and individuals are prominently involved in the program.

Moreover, this construction in Iraq has another point of appeal—it is not one of the burdens that the American taxpayer must shoulder. It is being paid for in the coin of the realm—Iraqui dinars—which the nation's oil production provides.

• **Scope of the effort**—In its first development program, covering the 1950-55 period, Iraq spent about $250 million, completing two major flood control projects—Habbaniya on the Euphrates River and Wadi Tharthar on the Tigris—but mostly setting the stage for the much broader scale second phase of the program now actively under way. For this 1956-1961 period, a sum of $1.4 billion was budgeted with the expectation that oil revenues would be available to pay for about 80% of it—about all that could be physically handled in any

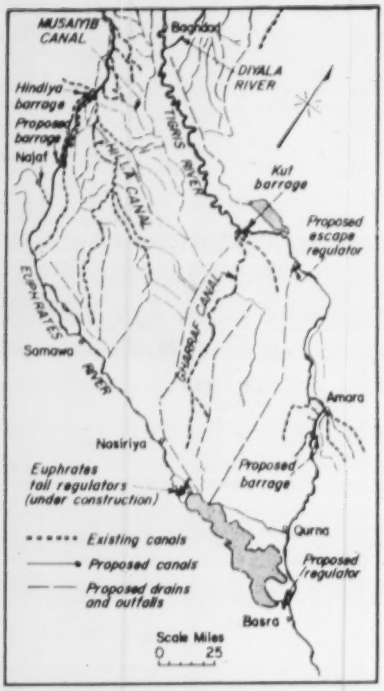
LAND TO BE RECLAIMED is the once fertile plain between the Tigris and Euphrates that was the envy of the world in Nebuchadnezzar's time. New irrigation canal is at left.



BRIDGE BUILDING is a necessary part of the extensive road construction program in Iraq. These foundations will support a major crossing of the Euphrates at Qurna.

NEW GRAIN SILOS tower beside a walled caravansery—the motel of camel caravan days—to aid farmers of northern Iraq to store and sell their wheat.

. . . Iraq's development: The projects selected



MANY MILES of additional irrigation pools and draws are in the program to bring the land between the Twin Rivers back into production.

event. Now, however, because of the loss of revenues as a result of the dynamiting of the oil pipe lines during the Suez debacle, it is estimated that money will be available for only about 65% of the original program.

For a country the size of California, whose total prewar budget was less than $30 million annually, even $900 million dollars, to be spent on construction projects in a six year period, is a considerable sum. When, however, a nation's outfitting requirements extend from the skin outward, as they do in Iraq, almost any amount of money can be committed to worthwhile projects.

The real problem to be faced is that of selection. In fashioning its coat to fit its cloth, Iraq has spent and pledged its money for dams, irrigation and drainage systems, roads, housing, factories, power plants and all manner of public facilities such as schools, hospitals and public buildings.

Whether the individual selections have always been the wisest possible can be argued—and frequently is by the Iraquis themselves.

Whether planning and construction are always efficient and effective is not arguable; those in charge admit they are not. Yet compared to the chances for misdirection and failure, the Iraq development program moves forward more often than it stumbles. Such a balance represents about par for any country. For one attempting to catch up on 2,000 years of neglect by lifting itself by its bootstraps, it is a record that merits praise, and one that should engender encouragement and help—from all Western nations at least.

• **The development concept**—Behind this bootstrap operation of Iraq's is the unique procedural concept of separating the development function from the ordinary operations of government and placing it in the hands of a special board. The claimed advantages of such a setup are that such a board is not burdened by the inhibitions to change which might be expected in existing government departments; that it is free of other governmental responsibilities; that it can use the services of outside experts freely without hurting its pride or reputation; and that it can budget its funds with a minimum of political interference.

Corollary to this concept is the rule that, once the board completes a project, it is turned over to an existing government department to operate and maintain.

That such a plan, which obviously deprived many governmental officials of powers and duties that they cherished, could be adopted is due largely to one man, Nuri-as-Said, who resigned only this year after thirteen terms as prime minister.

In Iraq, the government operates through a Council of Ministers appointed by the King from the two branches of the Legislature—the Senate, whose members are also appointed by the King, and the Chamber of Deputies, whose members are elected by the people. This council, whose members are the chiefs of the different government ministries or departments, is headed by the Prime Minister, whose function is to act for the King.

As Prime Minister, Nuri Pasha, as he is most frequently called, convinced the legislature that it should create a Development Board, and it was he, personally, who organized the board in 1950, charted its course and secured passage of the laws which assigned to its use 70% of the nation's rapidly growing oil revenue.

• **The Development Board**—The original Development Board was an autonomous body, separate and independent from the constitutional government. In 1953, however, the law was amended to include representation from the government in the persons of the Prime Minister, who became chairman, and of the Minister of Finance and the Minister of Development. In addition

Mesopotamia's Rich History

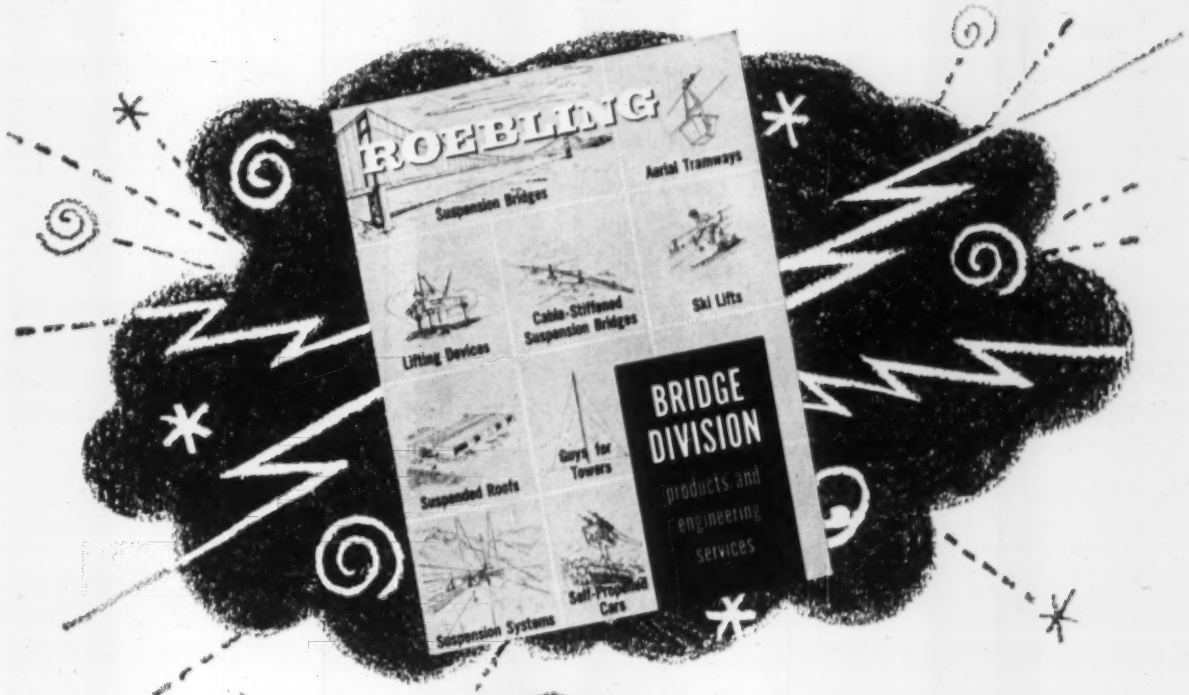
Iraq is accurately described by its ancient name of Mesopotamia—Land of the Twin Rivers. And it is these two streams—the Tigris and Euphrates—which give the present development program its main force, just as it was these same rivers which supported the ancient civilizations which flowered in Mesopotamia from at least as early as 3,000 B.C.

Without going back farther than about 2,000 B.C., Babylon, whose ruins are some 50 miles south of present Baghdad, was a city of great splendor and power. Under its King Hammurabi, the world's first code of laws was established, the art of cuneiform writing was developed, and architecture and sculpture and the use of mathematics flourished.

This early Babylon all but disappeared 400 years later, when the conquering Hittites from the north (in present Turkey) set up the Assyrian Empire with its capital at Nineveh, now Mosul. But Babylon came back in about 600 B.C. and was rebuilt by King Nebuchadnezzar, with its famous Hanging Gardens and other architectural wonders. It was still going strong as late as 323 B.C., when Alexander the Great died there.

There followed a long period of Persian domination, during which the remarkable brick arch of Ctesiphon, still standing not far from Babylon, was constructed. Conquered next in 637 A.D. by the Arabs, Mesopotamia centered its city life in Baghdad which became a great center of learning and commerce for six more centuries before it was sacked by invading Monguls in 1258 A.D. Finally in 1533, the Ottoman Turks took over, not to be displaced until after the First World War in 1914. The present Kingdom of Iraq was set up in 1921. It operated as a British mandate until 1930, when its was given full independence.

REMARKABLE BRICKWORK, after 2,500 years. The mortar was asphalt.



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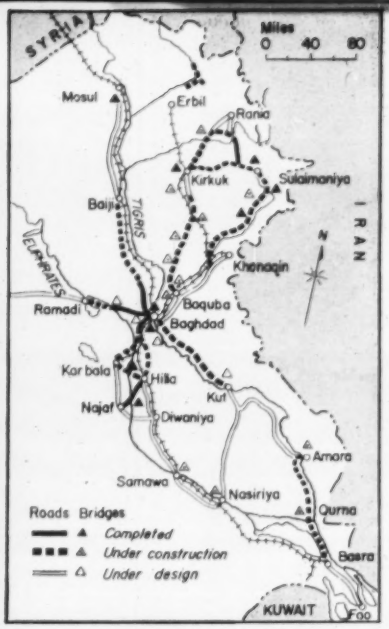
. . . Iraq's development: Irrigation and roads

REGULATOR STRUCTURE is one of five under construction across the "tails" of the Euphrates at the head of Hammer Lake.



ROAD CONSTRUCTION PROJECTS fan out from Baghdad to all major points.

to these three, the board has an executive vice chairman and six executive members. Under the present plan, the Ministry of Development acts as the executive arm of the board.

While policies and program are set by the Development Board, the actual work of planning, design and administration is entrusted to a staff divided into several technical sections.

At present, there are five and, in the order in which they were organized (which roughly reflects the relative current importance given their work) they are: irrigation and drainage; roads, bridges and public buildings; industries and power; agriculture; and housing. In addition the board has organized a directorate of summer resorts and tourism to handle this type of development work, and a land development commission to oversee the distribution of state-owned lands to farmers.

The amount of money allotted to each of these divisions of the board's staff is reflected in the accompanying table which lists the original budget items for the current six-year plan. Although most of these funds are administered directly—and this is the case for all major projects—some of the money is allotted to the various government ministries and to special government agencies who expend them under board supervision. In this latter class are the Ministries of Public Works and of Agriculture, the Tobacco Monopoly Administration, the Grain Board, and the Basra Port Authority.

Broadly, the method of operation is for the technical section concerned to originate a project and then assign it to a firm of consulting engineers for a study of its feasibility and benefits. The results of this study are then passed to the Board for final decision. If this is favorable, the technical section and the consultants prepare designs and specifications, and offer the project for international bids. Contracts usually have gone to the lowest bidder.

A significant fact about the Development Board is the extent to which it has relied on foreign advice and help. Much of its present basic policy stems from an overall report, "Plan of Action", made in 1955 by a foreigner, Lord Salter of Great Britain. Moreover, two of the executive members of the board itself are foreigners—American and British. Also the irrigation and drainage section is headed by an American, the industries and power section by a Frenchman, and the housing section by a Greek. In addition; wide use is made of foreign consultants, mostly American and British, and all of the major jobs have gone to foreign contractors—American, British, French, German, Lebanese, Syrian, Norwegian and Italian.

• **The development problem**—Simply stated, the job of the board, its engineers and contractors is to remold a rundown country into a modern pattern in which agriculture is the mainstay, and industry—based on local crops and materials—provides the supplemental employment and income.

The stage for this drama is roughly a triangle, with its apex at the southeast on the Persian Gulf and its base against the Syrian and Turkish borders at the northwest. Within this 172,000 sq mi area, the Tigris and the Euphrates Rivers follow parallel paths from base to apex, joining into one stream, the Shatt-al-Arab, to enter the Gulf. As a first act, the waters of these great rivers must be controlled and used.

In the northeast of Iraq, the topography is dominated by the mountains of Kurdistan, which rise to heights of 11,000 ft and extend into Iran to the east. Useful for damsites and bad for roads, this mountainous area must be made to accommodate both.

West of the mountains, rolling uplands contain enough good soil to grow crops and receive enough rain to yield one harvest a year without irrigation. Here in the northwest, relatively large wheatfields suggest similar scenes in the northwest U. S. Here, also, are the cities of Mosul and Kirkuk and the country's major oilfield. Better housing and transportation, more electric power and new industries are on the development docket of this area.

In the southwest, largely unusable desert extends to the Syrian, Jordan and Arabian borders, while in the center of the country, along the Twin Rivers, is a vast alluvial plain, 100 miles wide and 300 miles long, extending, flat as a table, to the marshes and date groves in the hinterland of Iraq's seaport city of Basra.

Containing two-thirds of the country's cultivable land, this alluvial plain is crisscrossed with the remains of ancient irrigation canals and threaded with old and present meanderings of the rivers. This is the land which must be restored to agriculture by a new irrigation system. In addition it must be protected from floods, as also must Baghdad in its exposed location in the northern portion of this plain. And with Baghdad needing everything a neglected city of a million inhabitants would need, and with Basra requiring a port that a half dozen arriving freighters

Slow Pay for Contractors makes roads cost more!

In a recent issue of the Washington News Letter, Duane L. Cronk, "Roads and Streets" Washington Editor, reports:

Credit needs of the highway industry to meet the expanded road-building program have just been released by the American Road Builders Association. ARBA believes that, in spite of the tight money situation, highway construction will not be deterred.

The ability of contractors to bid on work is markedly affected, however, ARBA declares, by their supply of working capital. The implication is that if a state highway department wants the most contractors possible bidding on future jobs, it should do what it can to make it financially possible for them to do so. That means retaining less money and making quicker payments for work completed. Here are some practices ARBA would like to see highway officials adopt to bring money earned by contractors into their pockets faster:

Reduce present 10% ordinarily retained on contract work to maximum of 10% retained only on first 50% of work performed under contract.

Assign enough men within the department to processing of contractor's estimates to assure prompt payments.

Reduce the regular estimate payment interval from one month to two weeks.

Schedule lettings to avoid overloading contractor capacity in any period, and plan them at least six months to a year in advance.

Pay for materials delivered to job site to fullest extent possible.

Make progress payment on basis of plan qualities, rather than waiting for detailed computing of estimates. Compute final estimates only.

Contractors make only about 2% profit after taxes, according to ARBA's Special Task Force Report. Another 2% of the contract dollar must be set aside by contractors in the higher income brackets for incomes taxes. This leaves 96% of the contract dollar — 20% for equipment, 35% payrolls, 41% materials and overhead — for all of which the contractor must obtain financing. The National Highway Association foresees that as the National Highway Program picks up speed, the ability of the contractors to take on as much work as they could easily handle on the job, would be limited by their financial resources.

This is a particularly pertinent problem because of prequalification (only 10 highway departments do not prequalify) by which a state insists on the financial ability of low bidder to swing a project before awarding him the contract. Bonding companies, too, scrutinize a contractor's fluid assets closely before approving him for the required bonds.

ARBA believes that two obvious ways to keep contractor credit fluid would be to liberalize the retainage practices followed by the state highways departments, and speed up payments for work completed. They say:

"We estimate that, if a state retains 10% of the contractor's earnings on a $500,000 job, it ties up a total of $50,000 of his money or an average of $25,000 through the life of the contract. If partial payments are delayed, as they frequently are, by even as much as two weeks, another $20,000 of the contractor's earnings are frozen during the life of the contract."

QED . . . Contractors must include these financing costs in their bids . . . they are forced to delay bidding (or starts) on new highway jobs until final settlement is received for previous jobs. Both of these end results create higher costs and slower progress on urgently needed-now highways.

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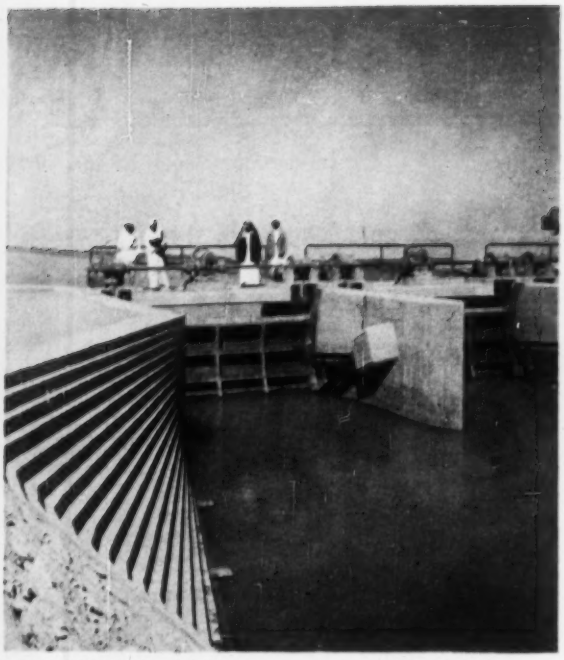
DRAINAGE is the key to successful irrigation in Iraq's alluvial plain. Modern earthmoving equipment is digging the ditches which will keep the soil free of plant destroying salt.



MAIN MUSAIYAB CANAL incorporates in this regulator structure Iraq's first radial gates and a unique and simply constructed transition section of canal wall made from concrete blocks.

. . . Iraq's development: Floods to control

won't disorganize, the construction calendar for this region is full indeed.

• **Everything depends on water**—Wesley Nelson, U. S. irrigation expert, who served as an executive member of the Iraq Development Board from 1952 to 1956, has voiced the philosophy which governs these development operations in Iraq.

In his valedictory address, he said, "The basic economy of Iraq will eventually rest in a permanent fashion on its rivers and lands. During the time the exhaustible resources (oil) are being expended, the economy based on inexhaustible agricultural resources can be founded. The control of the rivers is of first priority. Iraq should not be diverted by other schemes and overlook this fact."

Broadly speaking, Iraq has not been diverted, even though some of its other needs—housing, schools, hospitals, factories and roads—have required attention along with water. Even with this, however, nearly a third of all development money is going into irrigation and flood control projects. It seems doubtful that the country has the capacity for physically handling more such work or for politically resisting demands for other types of facilities.

Three types of activity characterize the water development effort: the construction of flood control facilities, including dams, dikes and diversion works; the construction of irrigation canals, drains and outfalls; and the drilling of artesian wells in areas that cannot be irrigated.

Flood control is sparked by the annual high waters in the Twin Rivers, which periodically threaten disaster to Baghdad and inundate vast areas in the alluvial plain.

Back of the irrigation drive is the fact that of the 13 million acres of arable land, only 8 million are under cultivation and, because of the fallow system of farming, only about 4 million acres are in crops in any one year.

All of this water development program is based on a comprehensive report on the utilization of the waters of the two rivers made by the American consulting firm of Tippetts, Abbett, McCarthy, Stratton in 1952-53.

• **Flood control**—The first activity undertaken by the board after its creation in 1950 was flood control because of the urgency of protection for Baghdad and because reasonably complete plans for the two key projects—Habbaniya on the Euphrates and Tharthar on the Tigris—were already in being.

Both of these schemes—first devised in 1908 by the famous British irrigation engineer, Sir William W. Willcocks, whose subsequent studies, in fact, laid the groundwork for all of Iraq's present water development—use natural depressions in the desert as reservoirs for excess floodwaters. Their general layout is indicated on the accompanying map. Both are completed and in service.

The Habbaniya project includes the Ramadi Barrage on the Euphrates, a 100,000 cfs gate-regulated canal (the Warrar Inlet) leading from its reservoir to the desert depression, Lake Habbaniya, and two outlets from the lake—Dibban, which can return 7,500 cfs to the Euphrates, and the Mujarra Escape Canal, which can carry 30,000 cfs into another desert depression, Abu Dibbis Lake.

Although principally for flood control, and able to handle about half the volume of the largest expected flood, Habbaniya, by virtue of the regulated return of water to the Euphrates, also serves an irrigation function.

The Tharthar project on the Tigris, on the other hand, is solely for flood control, although according to Kenneth Vernon—the American who heads the board's first technical section—irrigation possibilities, which include connecting the Tharthar depression to the Euphrates, are being studied.

The Tharthar project includes a barrage on the river at Samarra and a 330,000 cfs gate-regulated canal to carry flood waters to the desert depression, the Wadi Tharthar.

Since the Samarra barrage can pass 250,000 cfs (the channel capacity of the Tigris) through its seventeen 40 ft gates, and since a 330,000 cfs flow can be diverted, the two facilities together the-

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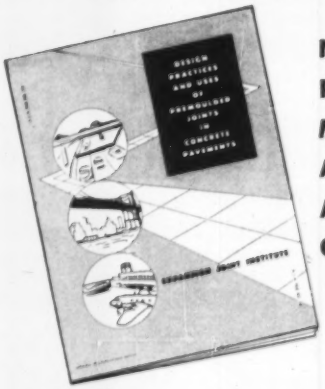

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The newly formed Institute has already produced a manual, the first of its type, in answer to the many requests for a technical manual concerning the use of expansion joints.

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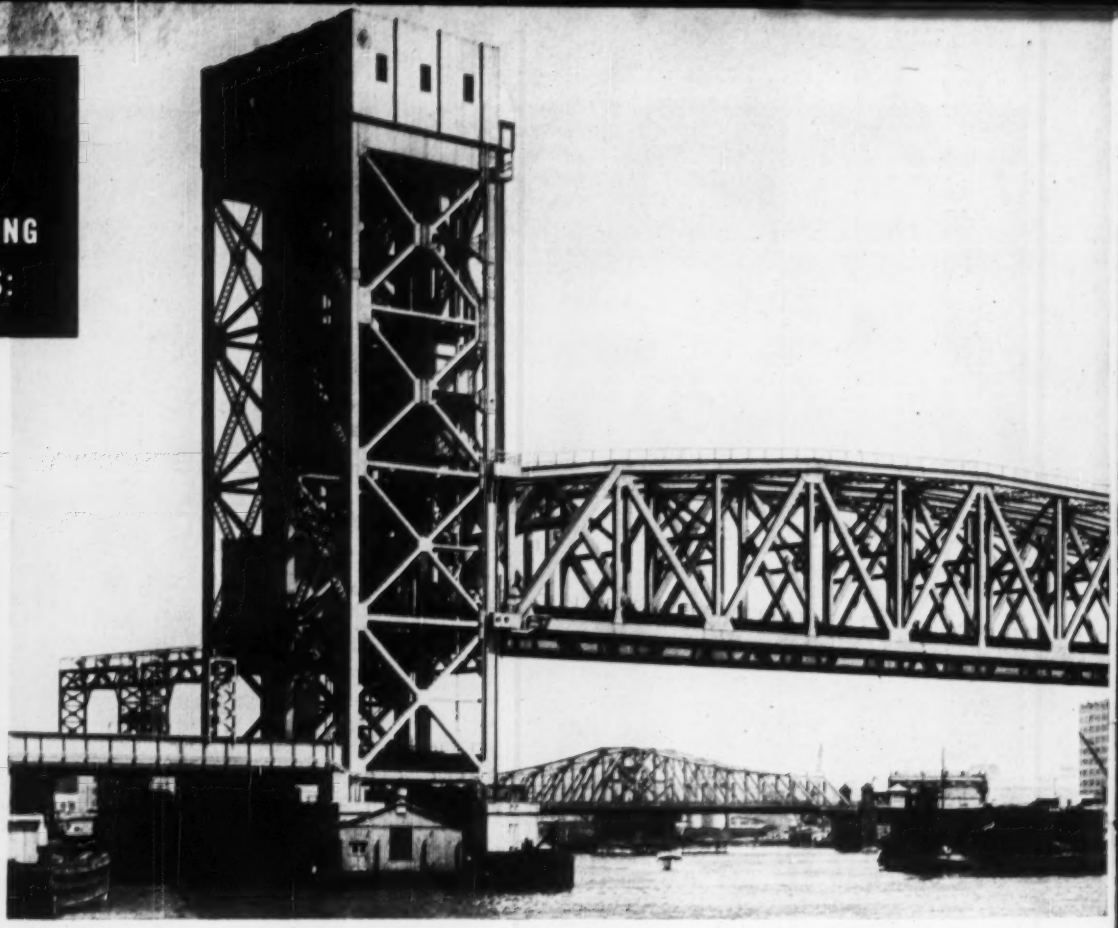
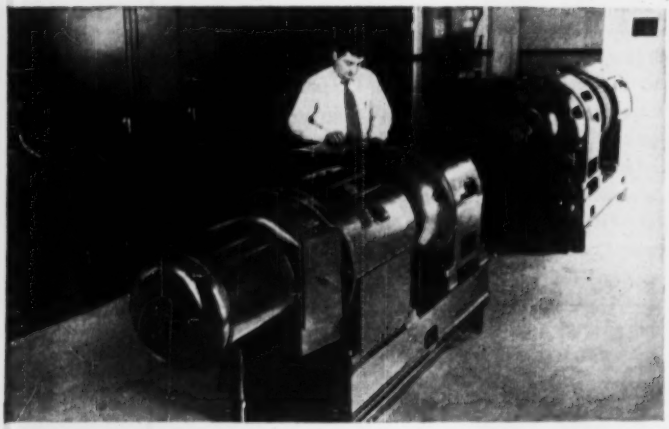


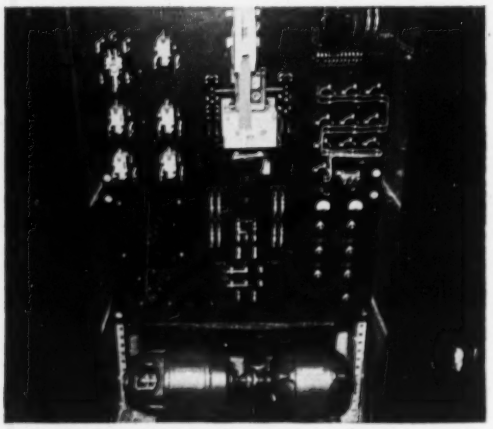
500 TRAINS A DAY roll over New York Central System's new Harlem River lift bridge in New York City. Reliable General Electric ***amplidyne-controlled*** system permits balancing of loads between tower drives. These tower drives provide accurate alignment of spans while moving and during seating.

Powered by reliable G-E amplidyne drive system . . .

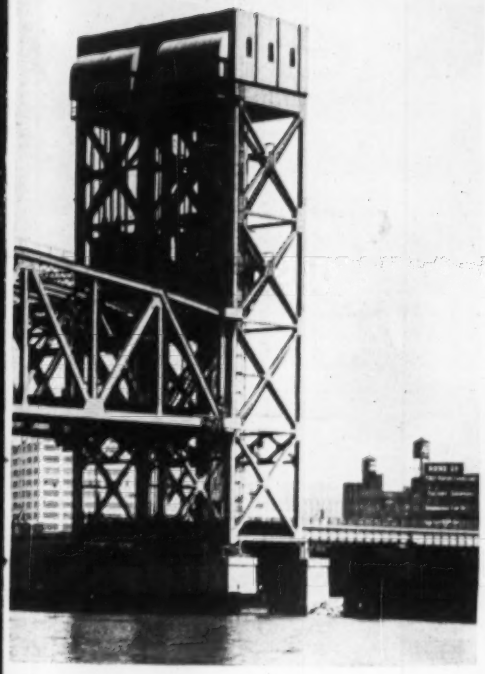
Vital N. Y. Central lift bridge carries 500

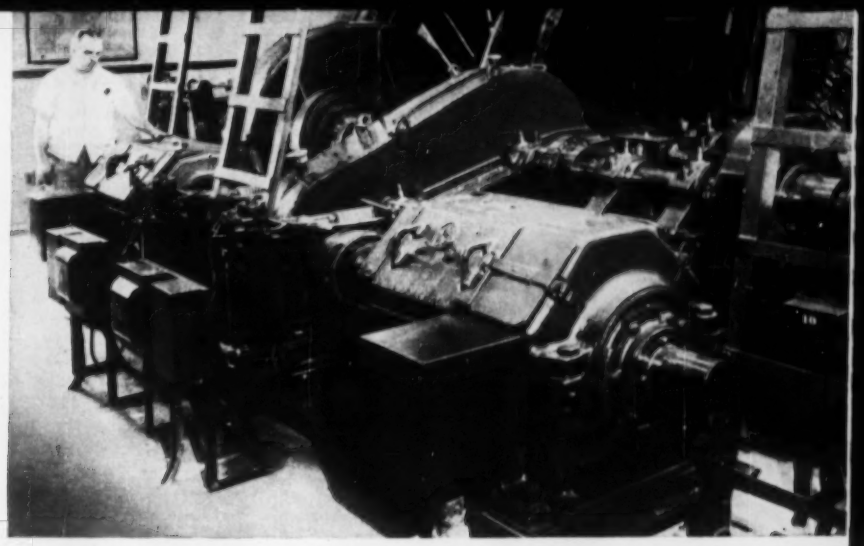


EMERGENCY POWER is provided by 50-kw G-E motor-generator set (foreground) and a small submarine cable tied to two power sources. Main General Electric motor-generator installation (rear) is rated 150-kw, supplies d-c power to drive motors. Continuous circuit adjustment helps reduce stresses on machinery, cables, and lengthens drive equipment life.



INSTANT RESPONSE and high amplification factor are two ***amplidyne*** features that help provide pin-point control of motor speed, torque output regardless of load variations. Built-in characteristics enable ***amplidyne*** to deliver reliable performance over long periods.





RUGGED 230-HP D-C DRIVE MOTORS raise two 1600-ton spans 110 feet within 90 seconds! Flexibility, reliability features of d-c motor, plus ***amplidyne's*** instant response and high amplification factor help provide maximum torque output quickly, smoothly.

PRECISE CONTROL of all bridge operations—lifting, lowering, seating—is centralized in a General Electric equipped master control station. Two separate power sources, one on each side of the Harlem River, are utilized to drive the bridge's span lifting mechanisms.

trains a day across busy Harlem River

General Electric equipment raises, lowers, seats two 1600-ton spans rapidly, smoothly, without rebound

New York Central operates 11,000 miles of railroad, providing fast, efficient service from the Atlantic Seaboard to the Mississippi Valley. Mainstay of this route structure is Central's main artery into the heartland of the Midwest.

VITAL LINK for passenger train service in this artery is a new 14,000-ton double lift bridge over the Harlem River in New York City. One of N.Y. Central's heavily-trafficked track sections, this bridge carries 500 commuter, through trains daily, plus switching operations. The busy waterway below handles heavy barge, freighter traffic.

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. . . Iraq's development: Food production and medical needs get priority

BAGHDAD MEDICAL CENTER, shown here in model, will include a 1,000 bed hospital and clinic and convalescent buildings as well as nurses' residences and its own power plant. A sum of $14 million has been allocated for its construction.

oretically can handle the maximum flood of something over 500,000 cfs.

The Habbaniya facilities, exclusive of the Mujarra escape canal, which was built earlier (1941), cost $12.5 million. The price tag on the Tharthar project was $45 million. Incidentally, the board borrowed $12 million from the World Bank to start the Tharthar project, but quickly paid it back when oil revenues increased. It has not been in the loan market since.

Because tributaries of the Tigris also must be controlled in their upper reaches as part of the flood control plan, and to provide storage for irrigation purpose, some major dams are required. Thus, there is Derbendi Khan Dam on the Sirwan River and Dokan Dam on the Little Zab River, both under construction, and Bekhme Dam on the Great Zab for which the design is completed.

In addition, a dam site on the Euphrates at Eski Mosul is being investigated, and several smaller projects have been proposed. This dam work will be described in a subsequent article.

• **The great reclamation effort**—South of Baghdad in the great alluvial plain between the two rivers—and further south where reed-grown marshes intrude—irrigation and drainage dominate the development effort. Here, where the Garden of Eden once may have been, the decisive battle to recreate a prosperous agricultural economy must be waged. Unless it is won before the oil gives out, Iraq will not have much use for the other facilities it is now developing with so much hope.

The board has entrusted the investigation and program development in this central and southern part of the country, covering irrigation and drainage as well as river navigation possibilities, to Tippetts, Abbett, McCarthy, Stratton, and this U. S. consulting firm now has an organization numbering about 250 people in Iraq headed by Brig. Gen. Donald Shingler (U. S. A. retired).

As project studies are completed, they will be submitted to the board for approval and contract letting. To date, one large job is under way—the construction of regulators or gated dams across five "tails" of the Euphrates—to control the flows of this stream's branches at the upper end of Hammer Lake. Also, a bid call was announced late in November for a $12 million drainage project in the Euphrates basin near Nasiriya.

Since stream regulation for irrigation in this region south of Baghdad is already reasonably well provided for by two existing barrages—Hindiya on the Euphrates, dating from 1913, and Kut on the Tigris, completed in 1939—the task is one of selecting promising areas for development or relocation, and designing networks of ditches and drains to serve them. The government's basic policy is to develop areas of presently unproductive public land (as contrasted to present irrigated private holdings) and to distribute it among needy farmers. Some of these are peasants who will no longer work as laborers for the wealthier landowners and are migrating to the cities, others are nomadic tribesmen that the government wants to settle.

A few such areas already have been opened, the most extensive being the Greater Musaivab project comprising 250,000 acres to the east of the Hindiya Barrage, which was developed by the Irrigation Directorate of the Ministry of Agriculture. Settled on 40 acre plots the farmers will be government tenants under supervision for 10 years, after which the land can be registered in their names. Initially, at least, there will be no charge for irrigation.

Among the larger projects being studied for the board by TAMS is one of 480,000 acres east of the present 1,000,000 acres of land irrigated from high waters in the Gharraf Canal, an old branch of the Tigris running south from the vicinity of Kut Barrage; four regulators on the canal will be built to make water available in the low water season. This project would also require a 30 mile 3,600 cfs supply canal.

Another job is an extension of the Hilla project—near the ruins of ancient Babylon—which will encompass 180,000 acres. The 5,500 cfs Hilla Canal, which takes off from the Euphrates just above Hindiya Barrage and already serves about 500,000 acres, will be enlarged to 9,000 cfs size to provide the necessary increase in the water supply.

(Continued on page 46)

How Iraq Plans to Spend $1.4 Billion

Development Boards Budget, 1956-61

Type of Work	Amount	% of Total
Administration; Studies	$20,580,000	1.4
Irrigation; Flood Control	430,512,880	30.7
Roads	178,320,800	12.7
Bridges	64,092,000	4.6
Airports	24,784,340	1.7
Railways	69,832,398	5.0
Seaports	11,200,000	0.8
Hospitals	27,930,000	2.0
Schools	17,679,200	1.3
Public Buildings(A)*	58,520,000	4.2
Summer Resorts	7,224,000	0.5
Housing	67,438,000	4.9
Industry and Power	187,933,808	13.4
Agriculture, Artesian Wells	40,003,090	2.8
Public Buildings(B)*	166,250,000	12.0
Misc. Projects	27,720,000	2.0
	$1,400,020,516	100.0

* Public Buildings (A) are handled by the board while Public Buildings (B) are financed by the board but handled by regular government departments and agencies.

LOADING PLATFORMS MUST BE

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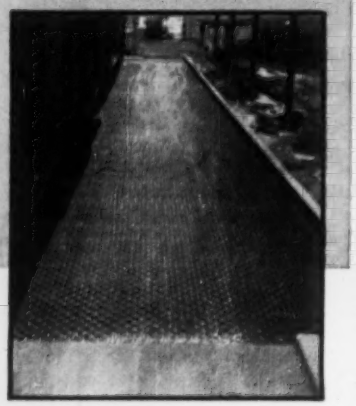
DRY



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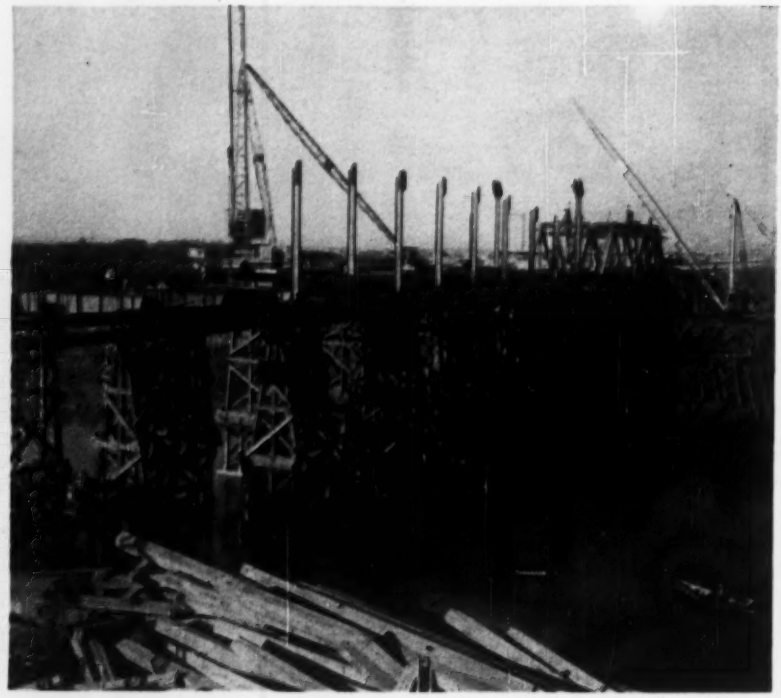
. . . Iraq's development: Rails and bridges



RAILROAD IMPROVEMENT will increase Iraq's transport capacity. This new bridge will carry the Baghdad-Kirkuk line across the Diyala River at Baquba. A new highway bridge is also under construction a few hundred feet away.

The really big problem to be faced in this reclamation process is the return to productivity of land abandoned because it became too salty from lack of drainage.

Most histories say that ancient Mesopotamia lost its irrigation system through destruction by the invading Moguls, but modern agricultural experts are agreed that the practice of irrigating without drainage was the real culprit. Long ridges of salt, resembling levees, attest to the fact that farmers scraped the accumulated salt off fields as long as they could and then abandoned the land when it became too salty despite surface removal. It is interesting to note that one of the board's consultants is the University of Chicago's Oriental Institute which is attempting to discover all it can about the ways the ancients built and operated their irrigation system.

Eventually, great drainage outfalls will be built from Kut to Hammer Lake, and from this outfall northward almost to Baghdad (the latter constituting in effect a third river between the present two), but for the present only what might be called branch drains will be incorporated in each new project developed. Drains will also have to be built on presently irrigated land.

However, the mere construction of drains will not, by itself, solve the salt problem. First, the drains will have to be operated in such a way as to leach the old salt from the soil, and then irrigating methods will have to be used which will avoid further salinization.

Agricultural experts on TAMS staff are studying the leaching problem intensively, and explain the requirements this way:

In a calcareous soil like that in Iraq, irrigation without drainage causes the exchange of sodium for calcium cations absorbed on the soil thus destroying its permeability. This sodium has to be removed by changing it into a soluble salt, sodium sulphate, which can be washed away through the drains. The change to sodium sulphate can be effected in one of two ways—by the addition of calcium in the form of gypsum or by adding sulphur to react with the natural lime in the soil.

Iraq has ample supplies of both gypsum and sulphur, the latter obtainable from its natural gas. Gypsum has the advantage of a rapid reaction as compared with sulphur. On the other hand from 4 to 10 tons of gypsum per acre, depending on the type of soil, would be required. Although sulphur has a slower reaction time, only about a fifth as much sulphur as gypsum would be required.

South of the alluvial plain, where the rivers spread into finger branches and marshy lakes overgrown with reeds and then merge into a single stream

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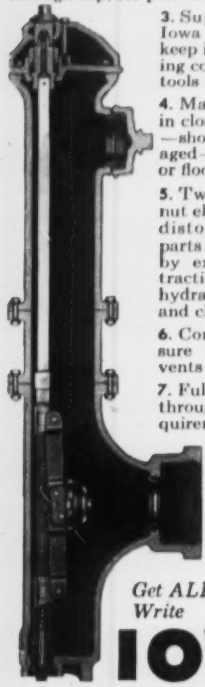

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. . . Iraq's development

(the Shatt-al-Arab whose course down to Basra is lined with date palm groves) the land reclamation and improvement problem has a different aspect.

Some of the marshes can be drained, and this will be done, although not in wholesale manner, since the reeds are widely used for mat weaving and also for fuel. Also the board is studying the possibility of a paper mill using the reeds as raw material. The date groves get their water from tidal irrigation—fresh water is forced up the irrigation ditches by a rising tide, and drains out on a falling tide.

The immediate task here is to dredge accumulated silt from the ditches. There are alluvial areas around Basra also which could be reclaimed by pumped irrigation and pumped drainage, and six of these are under study and design by TAMS.

Flood control and navigation are being studied in these lower reaches of the two rivers which inundate much of the area between Kut and Hammar Lake at times of high water. The tail regulators now under construction on the Euphrates at the end of the lake are a part of the program. Similar regulators on the escape channels from the Tigris eventually will be built as well as a dam and navigation lock on the river near Amara.

In total, the water problem is being attacked all the way from Iraq's upland and mountainous north to its southern extremity at the Persian Gulf. Some success is already apparent, but the greater benefits will come about four years hence when projects now under way are completed.

• **Camel trails to motor roads**—The roadbuilding requirements of Iraq are second in urgency only to water use and control. Unless the farm produce can be moved to market on motor roads instead of camel trails, and the new industries' raw materials and products brought in and distributed, a solid basis for a higher living standard will be lacking. The board has recognized this by budgeting nearly $250 million for roads and bridges in the six-year program.

Actually the board made a rather substantial beginning on road-building several years ago, but because of out-of-date specifications and a slowness in effecting changes, some of the new roads failed under the first heavy traffic. One such was a highway leading into the Dokan damsite, where inadequate subgrade compaction caused extensive surface breakup.

Most of the early contractors also bid too low, causing several to give up their jobs before completion, which put the road program considerably behind schedule. Lack of sufficient staff for the Board's road section has also been a handicap which may be overcome in the future by using more consulting engineers. All bridges are given to consultants at present.

The board's present road program covers about 1,200 miles of highway, with the main lines fanning out from Baghdad north and south running along the rivers. Lengths of from 10 to 25 miles outward from the city are completed, and work is under way on extensions.

One of these main highways will go to the holy cities of Karbala and Najaf. Another is being built to Kut. Still a third goes up the Tigris toward Mosul. A little east of this, a road to connect Baquba with Kirkuk is under construction, as is one from Baquba up the Sirwan River to Sulaimaniya and thence across to Kirkuk. In the south, the principal project is a 100 mile road up the Shatt-al-Arab and the Tigris from Basra to Amara.

In addition to these roads, which are under the direct control of the board, the government's Public Works Department is building and improving a large mileage of other highways, with $40 million to spend over the six year period. The activities of the PWD are particularly significant in as much as it will inherit all of the roads for maintenance and operation, and in view of this fact has an extensive personnel training program under way, aided by the U. S. Highway Mission to Iraq.

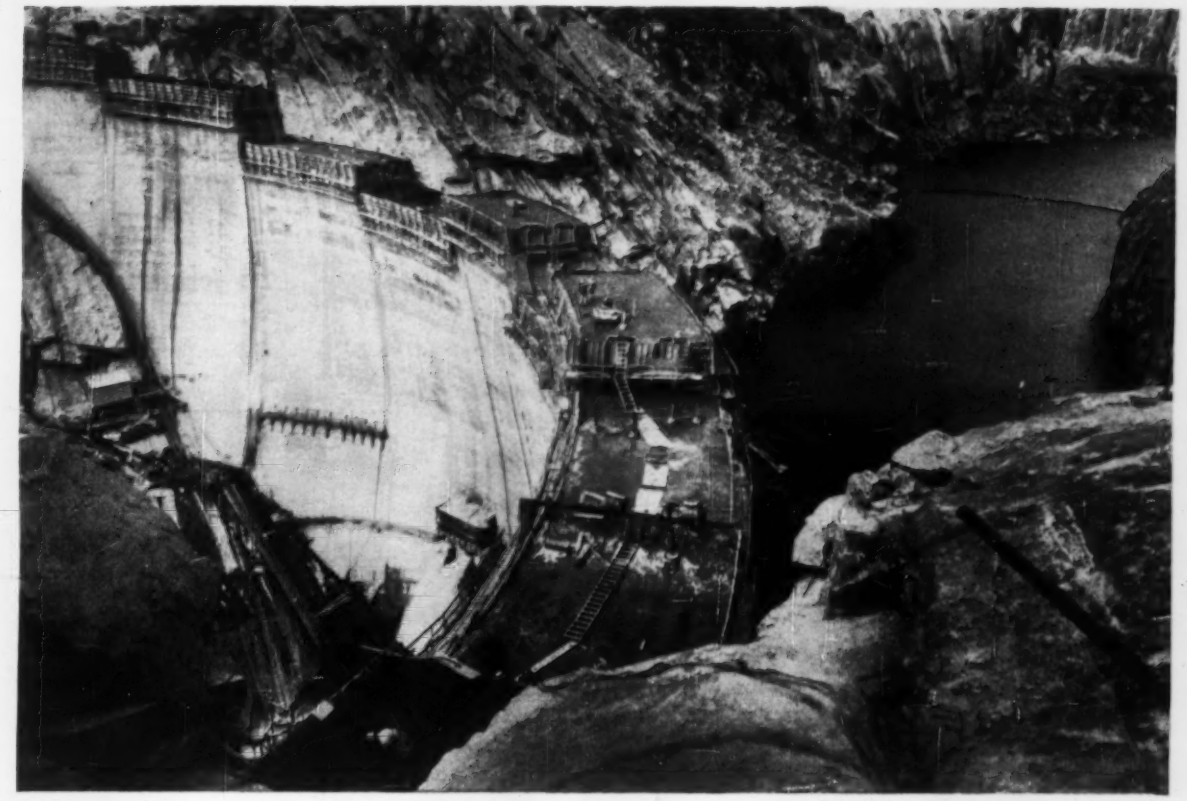
Consultant on this work is Edwards, Kelcey and Beck of Newark, N. J., and chief engineer of the mission is R. H. Baldock, former head of the state highway department of Oregon. The mission is helping the PWD to set up a modern highway organization, in which, at present, each Iraqui department head has the assistance of an experienced U. S. highway engineer.

Under Mr. Baldock's direction, the roads of Iraq have been divided into five classes based on traffic volume, with each class divided into three groups based on the type of terrain. He has also been concentrating on the problem of revising specifications to realistic modern standards.

In this work he has made considerable progress toward securing an increase in design axle loadings to 32,000 lb from the 18,000 and sometimes 24,000 lb now used. His theory is that control of heavily loaded trucks will be impossible, and therefore high strength must be built into the roads to save on maintenance.

All of the roads built in Iraq so far are of bituminous type, but the first concrete road is being designed now and may be built.

Roadbuilding in Iraq encounters terrain from mountainous to desert. Each



DONNELLS DAM, located 40 miles above Sonora, California, rises 484 ft. from its granite bedrock foundation. Blaw-Knox Steel Forms were used extensively in forming the 317 ft. high concrete arch which tapers in thickness from 41 ft. at its base to 10 ft. at its crest.

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Donnells is part of the huge Tri-Dam project which will supply water and electric power to a large part of Northern California. The project is a joint effort of Tri-Dam Constructors headed by Morrison-Knudsen Company, Inc., and includes Macco Corporation, Peter Kiewit Sons' Company and Stolte, Incorporated.

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. . . Iraq development: Housing needs are great

region presents its problems, with those in the desert and the south being farthest removed from normal. Grades are so flat that drainage is difficult. Soils are poor, of about A-7 type, and rock for subgrade has to be hauled long distances. Between dust storms and rains and floods in season, the weather is not kind.

A job which has encountered all of these troubles, is the 100 mile stretch of road being built from Basra to Amara by the U. S. contracting firm of Morrison-Knudsen.

M-K bid this job at $9½ million, and stands to lose that much again, partly because of these terrain and weather conditions, partly because of bad specifications—which it was costly to try to follow—and partly because the bid was too low and because not enough heavy equipment was brought in initially.

Indicative of troublesome specification items are the requirement to use "haunching stones"—a flush stone curb along each edge of the pavement, which has to be set by hand—and the use of a cement stabilized base under the pavement but not on the shoulders.

After the job was under way a decision was made to raise the grade, based on new flood stage data, and this required a considerable amount of haulage of fill instead of just pulling the material from the side ditches. Obtaining the necessary rock is another cost-raising item. Barged down the river from the quarry, it can only be stockpiled at a few locations, which still leave a 40 mile maximum haul.

These conditions are cited only to indicate that roadbuilding in Iraq is not without its difficulties and special requirements. On this contract, which is now about half finished, smoother sailing is in prospect, with specification difficulties ironed out, 75 American construction men added to the organization, $5 million worth of heavy construction equipment on hand, and an experienced construction superintendent in charge.

It is also significant to note that whereas several contractors from other countries have bowed out of their contracts when they got into difficulties, M-K, despite a large loss, has never considered that alternative. When it finishes the job next September, the road from Basra to Amara will consist of a 12½ in. rock base over 6 in. of cement stabilized subbase (8% cement by weight) compacted to 95% optimum density and topped with a 3 in. asphaltic concrete surface containing 4.75% asphalt by weight. The job was started with a 65-70 asphalt, which was later changed to an 85-100 which was easier to use. The asphalt surface will be 22½ ft wide to which the haunching stones at the edges add 6½ in. on both sides.

The Iraq road program also includes about twenty bridges, the majority of which are of deck steel-girder type, although through steel arch spans as well as trusses are used on several structures. A 550 ft span self-anchored suspension bridge is under design (by D. B. Steinman, consulting engineer, New York) for Baghdad, while a smaller crossing of the same type is under construction at Samawa.

In addition to roads, Iraq's transport improvements will encompass railroads and airports. There is $25 million for a new railroad from Baghdad to Basra via Kut and Nasiriya, while Sir Alexander Gibb and Partners, British consultant, is designing a new $11 million airport for Baghdad to replace the present one which is too close to the city.

• Mud and straw won't do—Iraq's housing needs are every bit as formidable as its water and road requirements—and more pressing politically. Promised something much better than the mud and straw huts of the past, the Iraqui people are becoming impatient for more visible progress than the Board has been able to show.

The task is a difficult one because the need is so great, so widely dispersed over the country and complicated by a scarcity of building materials and skilled building labor. Nevertheless, the adopted program of constructing 25,000 houses during the next five years—and in the meantime experimenting with different designs and materials by letting small jobs to fifteen different builders from almost as many countries—should soon begin to bear fruit.

To date nearly 4,000 housing units are under construction in Baghdad, 2,000 in Basra, 2,000 in Mosul and 700 in Kirkuk.

So far, the principal criticism is directed against the experimental program, which includes about 250 houses. Although all fifteen jobs are far enough along to permit some decisions as to which are successful and should be tried out full scale, none of the jobs started so far has followed the new designs. This is a matter of concern to some government officials, who feel that the foreign contractors may become discouraged and go home, whereas Iraq needs all of the help in this field it can obtain during this period when it is trying to develop its own skilled workers.

Those who criticize the speed with which the results of the experimental program are being used do not, however, find fault with the program as a necessary step in advancing the country's housing effort. They point to the fact that the units vary in cost from $2,000 to $10,000, depending on the size and facilities, so that all price ranges can be studied, that foreign contractors have teamed up with Iraquis so that there can be an exchange of information, that Iraqui workmen have gained experience with mechanical equipment, and that the speed with which various designs can be built can be weighed.

There is also the advantage of comparison and experience with materials not traditionally used in Iraq—concrete block, stabilized earth brick, fiberboard, precast structural elements, asbestos cement, foam concrete, and the like.

The only U. S. firm engaged in the experimental program is the IBEC Housing Corp., the Rockefeller company which has had so much success in developing new housing methods in Puerto Rico. Indicative of the thoroughgoing manner with which it tackles a housing problem, IBEC, when it was selected for the Iraq job, instituted a basic research program to guide it in selecting building types and materials.

The first study covered eight subjects: evaluation of climate data of Baghdad; radiation effects; orientation of buildings; shadings; wind effects; color; cooling possibilities; and effect of materials on temperature balance.

Among the useful conclusions were the following: the radiation of the roof exceeds the total of all the walls; buildings should be faced about 25 deg east of south to get the most sun in winter, the least in summer; east and west sides should be closed, and only small openings should be used on the north to obtain benefit from the prevailing north-south air movement; shading should be provided at the windows, with the overhang set at 60 deg.

It was decided also that the roof should be white, the walls light in color and the ground around the building dark so as to absorb heat and cut down reflection.

U. S. Consultants in Iraq

Harza Engineering Co.—Dams
Tippetts, Abbett, McCarthy, Stratton—Irrigation in south, grain silos, tobacco warehouses
E. Lee Heidenreich, Jr.—Grain silos
Kuljian Corp.—Irrigation in north
Ralph M. Parsons—Underground water resources
J. G. White Engr. Corp.—Power
Welton Beckett—Baghdad Hilton Hotel
Frank Lloyd Wright—Baghdad post office, opera house
Arthur D. Little, Inc.—Industrial survey
D. B. Steinman—Baghdad bridge
Litchfield, Whiting, Panero, Severid & Associates—Baghdad medical center

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. . . Iraq development: Industry gets a boost

With respect to materials, the conclusion was reached that they should not only have a good insulative value, but that they should be dense enough to hold some of the night coolness over into the daytime. As a result, the following materials were investigated: expanded clay aggregate concrete; pumice and gravel aggregate concrete; sand and gravel concrete with a high air content; no-fines concrete; structural gypsum; stabilized earth; and cellular concrete, either for insulation or for structural use.

In the end, IBEC chose a sandwich type wall in which a core of foam concrete having high insulation value was placed inside stone concrete surfaces. An important factor in this choice came from an investigation of the insulation factor (U) of various walls and roofs. Whereas a 9 in. brick wall with ¾ in. gypsum plaster each side (a frequently used design in Iraq) had a factor of 0.268, the sandwich wall with a 3 in. foam concrete core between 1½ and 4 in. layers of dense concrete had a factor of only 0.130. Moreover the core could be reduced to 2 in., and the U factor would go up to only 0.163.

In the sandwich finally used in its Iraq project, IBEC chose a 2½ in. foam core with a 1½ in. dense concrete surface either side made with ¼ in. aggregate. The wall panels cast in this design were 5 ft wide and 18 ft long. The roof panels were made in stone concrete and were 5 ft wide and 30 ft long; they were only 1½ in. thick but had 7 in. flanges around the edges. They weighed 2 tons each. For additional insulation, the roof was overlaid with asphalt and a mixture of clay and chopped straw applied in two layers. Partitions were made of stone concrete 4 in. thick.

The contract covered twenty 2-story row houses of wall bearing design without structural frame. All of the elements were manufactured on the site using Iraqi labor for both manual and mechanical tasks. Despite the use of a building design that departed farther from normal than any of the others used, the IBEC houses were built in the shortest time.

• Start of industry—Iraq can be an agricultural surplus country although probably not to the extent that it can finance its whole economy from farm produce. But, there is no reason why it should buy outside the things it can make itself. Operating on this theory, the board, through its technical section devoted to industry, mining and power, has embarked on a variety of industrial enterprises. The program being followed is one recommended by the U. S. consulting firm of Arthur D. Little, Inc., Cambridge, Mass.

It was natural that the country's oil industry should be a starting point for industrial development, so that an asphalt refinery has been completed near Mosul with an annual capacity of 60,000 tons, and an oil refinery near Baghdad with a daily capacity of 25,000 barrels. This latter plant, which produces kerosene and fuel oil and will soon be turning out lubricants, employs about a thousand workers.

Second on the industrial list, because of the construction program coming up, were cement factories. One has been completed near Sulaimaniya, and another at Mosul will be finished next Spring. Cement from the 350 ton a day Sulaimaniya plant is destined for use in Dokan and Derbendi Khan dams. Both plants have housing developments built as a part of the projects.

Since Iraq imports nearly two thirds of the 7 million sq yd of textiles it consumes each year, the Board decided that some textile mills should be built, and one has been completed at Mosul to make cotton cloth. Containing 25,000 spindles it will produce 25 million sq yd a year and give employment to 1 200 workers.

Another local product is natural gas, and at Kirkuk a sulphur recovery plant under construction will produce 300 tons of ammonium sulphate daily for use as fertilizer. The remaining "sweet" gas will be piped to Baghdad to be used for fuel. It is also from this plant that the straight sulphur would be obtained for desalting the farmland in the south.

Sugar is another import to which the Board has turned its industrial ear. It has been decided that a good grade of liquid sugar can be made from second grade dates, and a factory to produce this product is being designed for construction in Karbala. The sugar, it is believed, would be suitable for soft drinks and for pastry making.

Actually under construction at Mosul, however, is a more traditional sugar refinery although the country raises neither beets nor cane. The 35,000 ton plant will operate initially on 25,000 tons of imported raw cane sugar, to which will be added 10,000 tons of beet sugar when this crop is developed. Sugar beet cultivation is planned in the Mosul area and also in the vicinity of Sulaimaniya, where two other sugar refineries are projected.

Another industrial plant in the borderline class, but based on available raw material, is a paper mill which would use the reeds grown in the marshes of southern Iraq. A consultant has been engaged to study the possibilities.

Grain silos and tobacco warehouses also can be classed as industrial buildings, and a number of these are under construction following designs by Tippetts-Abbett-McCarthy-Stratton, aided in the case of the silos by E. Lee Heidenreich, Jr., consulting engineer of Newburg, N. Y.

Presently under way or completed are concrete silos with a capacity of 12,000 tons at Mosul and 8,300 tons at Hilla and Erbil. Each of these facilities has a receiving capacity of 66 tons per hr and a shipping capacity of 80 tons per hr. All of these silo jobs are being built by a Swedish contractor who has erected them rapidly using slip forms.

Also, at Basra, bids are in but contract not yet awarded for silos with a capacity of 65,000 tons, where grain can be received at a rate of 350 tons per hr and loaded on ships at a rate of 1,000 tons per hr. Raymond Concrete Pile Co. has a contract for foundation investigation on this job.

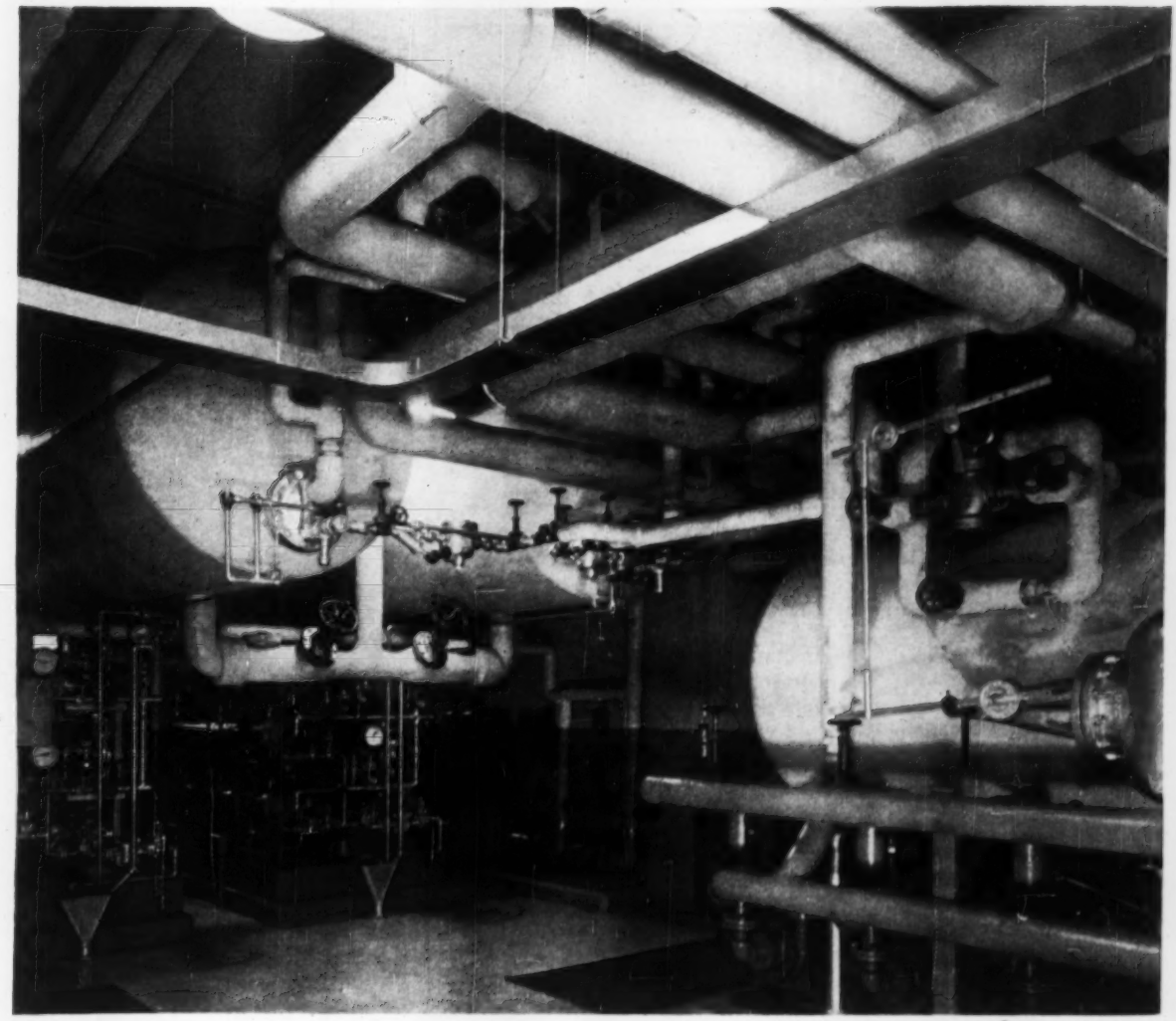
The tobacco warehouses are rigid frame steel buildings with aluminum corrugated roofing and siding. Thirty such buildings are under construction at several locations in the northern part of the country by Iraqui contractors. Materials for the buildings came from Italy.

All of the new industrial facilities are owned and operated by the government, which hopes that, sooner or later, private interests can be induced to buy into them. In this same connection the Board is beginning operation of an Industrial Finance Corp. to provide funds to small firms who want to expand.

To operate even such a small industrial complex as this, as well as provide light and power to the cities and eventually for irrigation pumps, Iraq needs more power. Accordingly the Board has financed the construction of an 80,000 kw power plant at Baghdad and 45,000 kw plants at Kirkuk and Basra, with provision for more than doubling their capacities. All will be operated on natural gas, and a system of transmission lines is planned to tie them into a grid.

• Public buildings, too—To top off the development effort, public buildings such as schools, hospitals, and post offices are under way in a number of cities, with the greatest evidence of progress in Baghdad, which numbers a Parliament building and a Royal Palace among its new structures.

For Baghdad, too, studies and designs are under way for a multi-building medical center, a university, a court house, a library, a fine arts building, an opera house and a sports stadium. How many of these will be started in the present program is still undecided.



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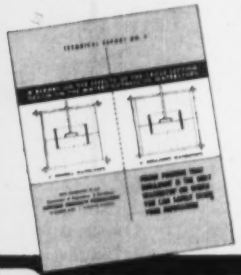

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. . . Iraq development

but the total budget for public buildings is a substantial $224 million.

• **A demanding future**—As Iraq begins to move broadly into the construction stages of its development projects, new problems appear and the time for solving existing problems grows shorter. A demanding future lies ahead for the Development Board.

One of the new problems is to find a way to continue its contracting on a unit price basis, and still be able to let contracts to other than the lowest bidder if that seems desirable; also to provide a procedure to protect contractors somewhat from cost rises beyond their control.

It is not so much that contractors want these easier conditions as it is that, getting in trouble without them, they endanger completion of the jobs, and may even be discouraged from bidding on future work.

Another problem is the training of equipment operators so that machinery breakdowns will not cause, say, earthmoving, bid at 11 cents per cu yd, to end up costing 25 cents as on one job.

There is also the problem of paving Iraq's engineers enough to keep them enthusiastic and working for the future of their country. Most of them are dismally underpaid at present.

The biggest continuing problem, however, is to train Iraquis to take over and operate the facilities when the Development Board completes them. On the technical level, some means of effecting closer liaison between the board's staff and the personnel in the ministries, who will inherit the projects, will have to be developed.

Then, a most formidable task will have to be faced when the attempt is made to resettle large blocks of the population on the newly irrigated farms. Nearly every farmer will require training and supervision in the handling of water. Most of them will want their houses on their land, but unless the farmers can be settled in small communities, there will not be enough supervisors to go around. Before some of the larger schemes are completed, smaller ones may have to be used to train supervisors.

It is this job of coordinating present construction with future operation requirements that makes the future so demanding in the board's planning from now on. Fortunately there is a growing awareness of the task ahead, so that Iraq's chances of success continue bright. Moreover, if it can actually mold a modern Mesopotamia, it will have pioneered a road that every underdeveloped country in the world would seek to follow.

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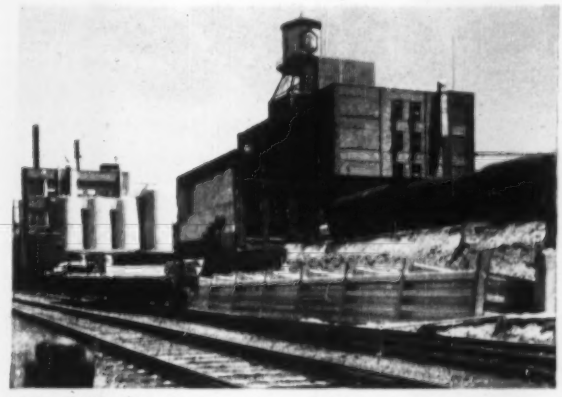
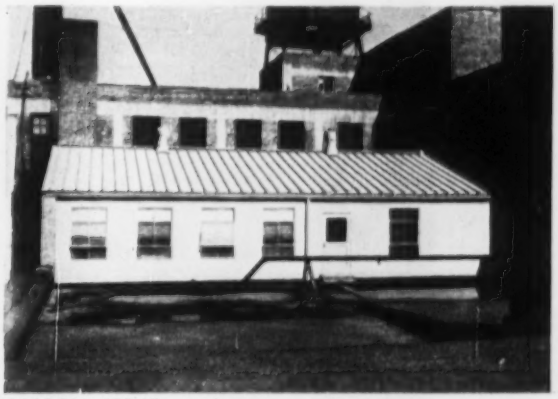


LAND SALVAGED—With an Armco Bin-Type Retaining Wall, shown partly erected, this plant makes maximum use of right-of-way. Tanks at right are buried underground behind the Armco Wall. Ground above the tanks will still be open for expansion.



ROOF-TOP OFFICE—This industrial plant, needing more office room but having no more ground available, installed an Armco Steel Building on the roof of an existing building. The relatively light weight of the frameless Armco Building made this structurally possible.

STREAM ENCLOSURE—These pre-assembled Armco MULTI-PLATE® Pipe-Arch structures will serve as an industrial stream enclosure. After installation the drainage structures will be covered with earth, hiding the stream and making the area suitable for future expansion.

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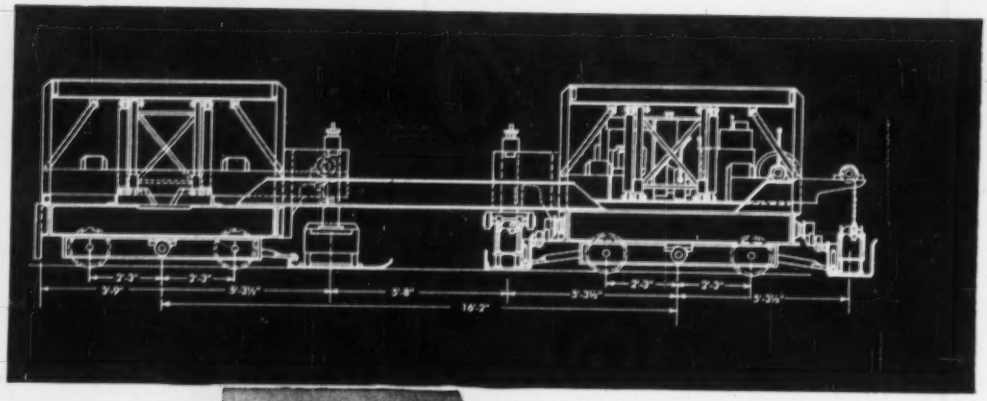

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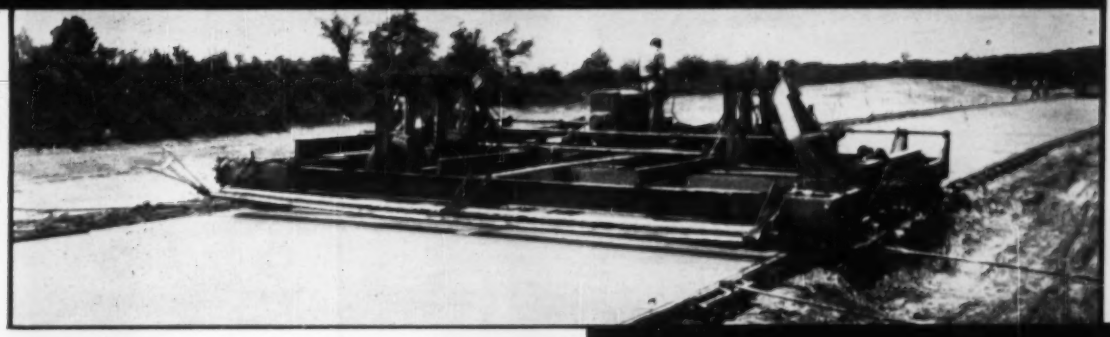

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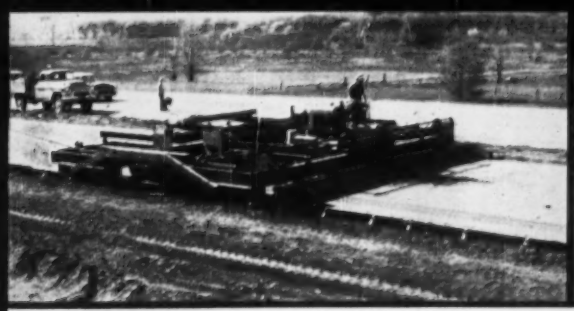
U. S. ROUTE 30 — J. A. Jones Construction Company uses combination on straightaway paving — Flexplane self-widener on interchanges near Mansfield, Ohio.

CONNECTICUT TURNPIKE—DeLillo Construction Company's Combination cuts hand finishing to a minimum.

U. S. ROUTE 12—Kalamazoo, Mich., bypass is worked by Carl Goodwin & Sons. Contractors generally report substantial savings over previous finishing methods.



U. S. ROUTE 23—Combination Machine owned by Denton Construction Company keeps up with three dual drum pavers south of Brighton, Michigan.

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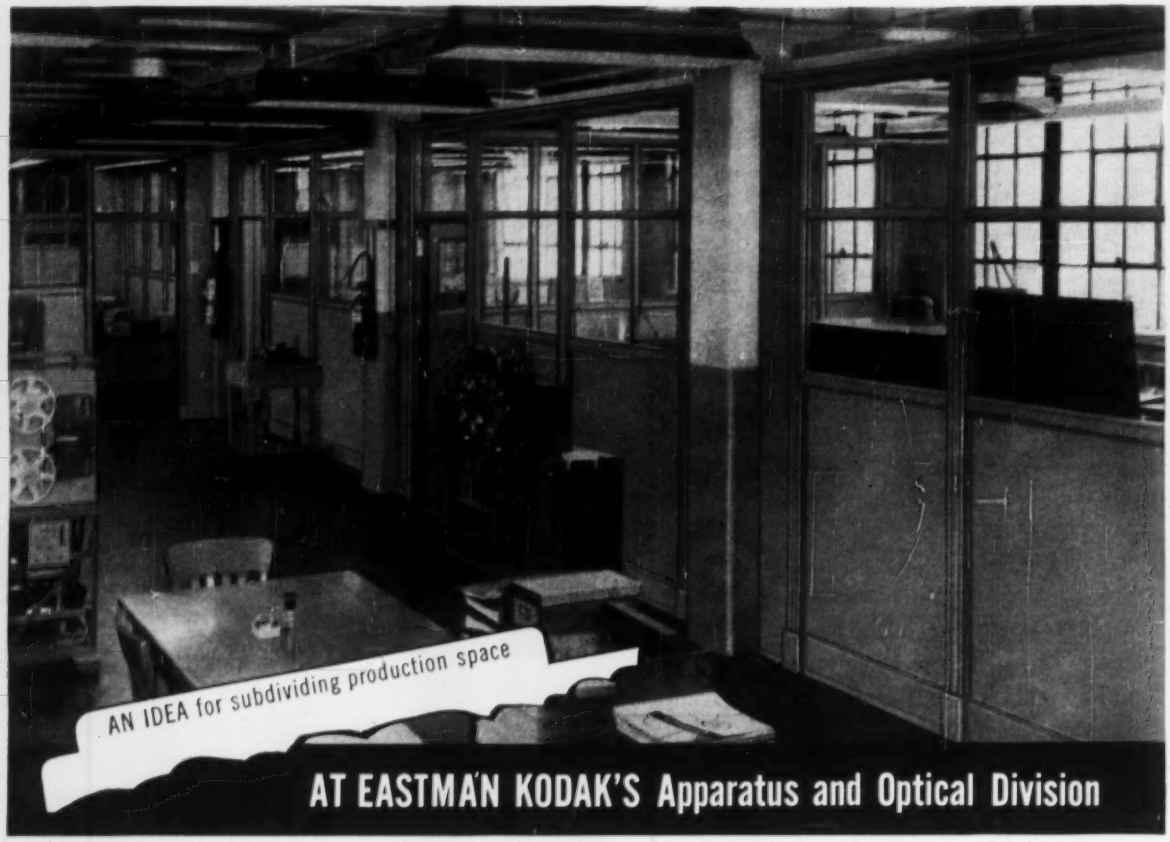

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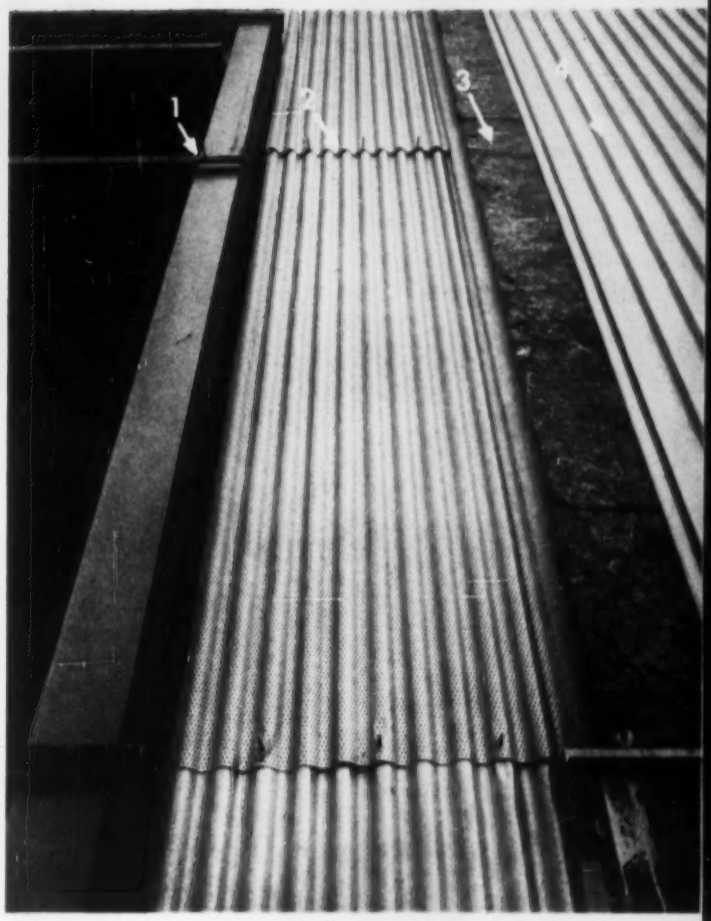


FIELD-ASSEMBLED sandwich walls are erected by (1) shoulder-type welded studs to already installed structural girts. Inner skin of perforated aluminum (2) is impaled and fastened to the studs with speed-clips. Insulation board (3) is installed in a similar manner. Finally, the outer aluminum skin is driven onto the studs and cap fasteners hammered to the studs.

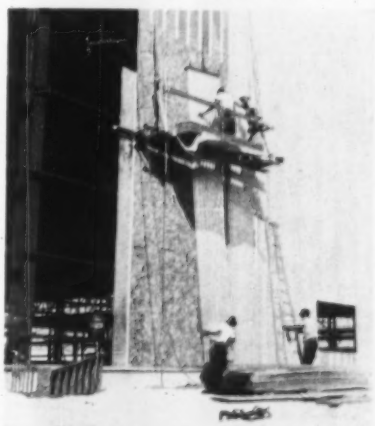
New Fastener Speeds Wall Assembly

By using sandwich walls field assembled with a new type of fastener on three plants it has built recently, the American Can Co. has obtained fast, low-cost enclosure. For new plants in Tampa, Fla., San Antonio, Tex., and Hillside, N. J., over 96,500 sq ft of sandwich walls were assembled on the job in this manner.

All the materials making up the wall, including either aluminum or steel inner skin, glass fiber-insulation board and exterior aluminum skin, were impaled and fastened on end-welded, shoulder-type studs attached to structural girts.

• **Erection procedure**—A lightweight stud welding gun first welded the studs to already installed girts. The inner skin of 0.024 in. aluminum or 24 ga steel was impaled over the studs and held in place with speed clips. Insulation board, either 1 or 1½ in. thick, was similarly erected and fastened. Finally, the outer sheet of 0.032 in. ribbed embossed aluminum was driven over the studs and aluminum cap fasteners were hammered lightly into position on the tips of the studs. The caps hold by gripping serrations on the stud tips.

• **Field assembly costs**—Bid price for the American Can Co. coil-processing plant and warehouse in Tampa was $1.22 per sq ft. Over 30,000 sq ft of the field assembled sandwich wall was installed by Paul Smith Construction Co.



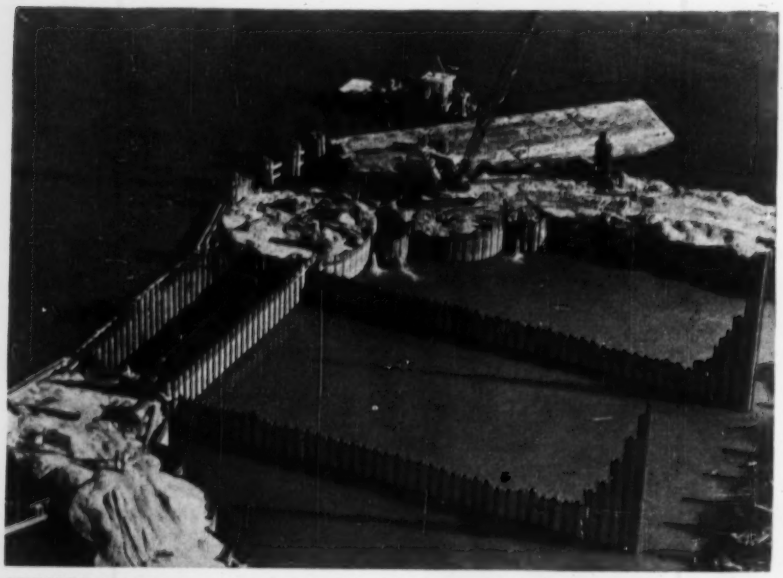
ALUMINUM SKINS for both inner and outer walls are erected in 20 ft lengths.

At the San Antonio project, bid price was $1.342 per sq ft for 25,000 sq ft of curtain wall. Corrugated Asbestos Contractors, Houston, who installed the walls, estimated a saving of $15,000 by field assembly over other types of construction.

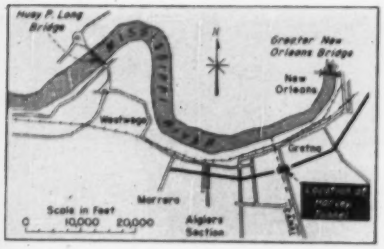
At the coil-processing plant and warehouse at Hillside, about 41,500 sq ft of sandwich wall was field assembled at a cost of $2.00 per sq ft. This price included a vapor barrier sheet and perforated metal inner skin for acoustical purposes.

Donovan Erection Co., Hillside, who installed the walls, claimed the field-assembled sandwich walls, even with the extra cost features, were competitive with other types of wall construction. It was estimated that labor erection cost was reduced by 30%.

SHAPING UP, cofferdam for tunnel construction extends halfway across New Orleans' Harvey Canal. Camera is looking eastward.



COFFERDAMS in poor river-delta soil had to be watertight, could occupy only half of waterway, because of heavy ship traffic.



Traffic on New Orleans' busy "West Bank" bottlenecked at busy Harvey Canal. Thus . . .

Automatic

Shu-Tien Li
Palmer & Baker
Mobile, Ala.

With the opening early in September of the four-lane Harvey Tunnel, Louisiana and Greater New Orleans could look with pride on a number of major accomplishments:

- A key structure in plans to unscramble the vast traffic tangle around New Orleans had been opened.
- The tunnel is said to be the first four-lane, trench-type tunnel ever built in the United States in a single monolithic reinforced concrete structure comprising twin rectangular traffic tubes.
- The Harvey Tunnel, along with another tunnel on the same side of the Mississippi River (the Belle Chasse Tunnel) is said to be the first entirely automatic underwater vehicular tunnel in the world.

• River in the way—The great crescent formed by the Mississippi River as it swings in an almost 180 deg arc around the city of New Orleans, was originally the basis of the city's growth as a seaport and industrial center. Over the years, however, the enormous growth of the city, engulfing marshlands and marginal areas on both sides of the broad, deep stream, has made the river and its tributary canals major obstacles to any plan for easing traffic congestion.

A particularly sore spot has been along the "West Bank" of the big river

COMPLETED TUNNEL is ready for business, just prior to formal opening. Lights, ventilation, traffic control are completely automatic.

Tunnel Unlocks New Orleans' Traffic Maze

in the region known locally as Algiers. (A quirk of local terminology is needed in explanation here: although the Mississippi River at one point actually flows almost due north, anything on the bank opposite the city is called "West Bank". This, despite the fact that the Algiers section is directly south of the city on the map.)

Part of the problem on the West Bank is to provide a through highway route to connect the existing Huey P. Long Bridge, some distance to the west, and the new bridge now being built across the river almost in the center of the city. (ENR June 16, 1955, p. 49).

On this route, which is itself part of a $200 million overall program for city traffic improvement, the real bottleneck is the busy Harvey Canal, which connects the Mississippi with Barataria Creek. A two-lane drawbridge across the canal, now replaced by the tunnel, had an average of 1,400 openings a month, with an average of three vessels with long barge tows passing during each opening. Operation of the bridge often stalled traffic to distances of a mile or more on either side of the structure, for as much as 10 minutes during each opening. Surveys indicate that more than 24,000 vehicles cross the canal every 24 hours.

This heavy vehicular and water-borne traffic dictated that a tunnel to replace the drawbridge, and also dictated the method of construction, which was basically to construct a cofferdam into the canal to a point roughly halfway across the 230-ft-wide waterway, build the tunnel section complete to a point behind the cofferdam, then seal it and rebuild the cofferdam from the other side of the channel.

The $5.1 million project (including right-of-way and engineering costs) had a three-way sponsorship, with the U. S. Bureau of Public Roads putting up $1.5 million, the Louisiana State Department of Highways another $1.5 million, and Jefferson Parish (county) underwriting the remaining amount.

• **Geometrics**—The tunnel has a total length between portals of 1,080 ft, with its underwater section, between ventilation buildings on either side, having a length of 540 ft. Open cut sections at either side, bringing the roadway from the tunnel portal to ground level, add an additional 1,200 ft to the length.

As finally designed by the consulting engineering firm of Palmer & Baker, Inc., of Mobile, Ala., the tunnel alignment is approximately east-west, in order to make a right-angle crossing under the canal.

The vertical location was governed by the requirements of the Corps of Engineers, which prescribed that the top of the tunnel must not be higher than—18 ft. MLG (Mean Low Gulf) for the 200 ft navigable fairway. Accordingly, the vertical profile consists of a mid-tunnel 300 ft vertical curve, with its low point under the centerline of the canal, flanked by 5% grades passing the portals.

The east and west ventilation buildings are located 270 ft from the low point, portal pump rooms located on the south side, and a mid-channel pump room located under the walkways.

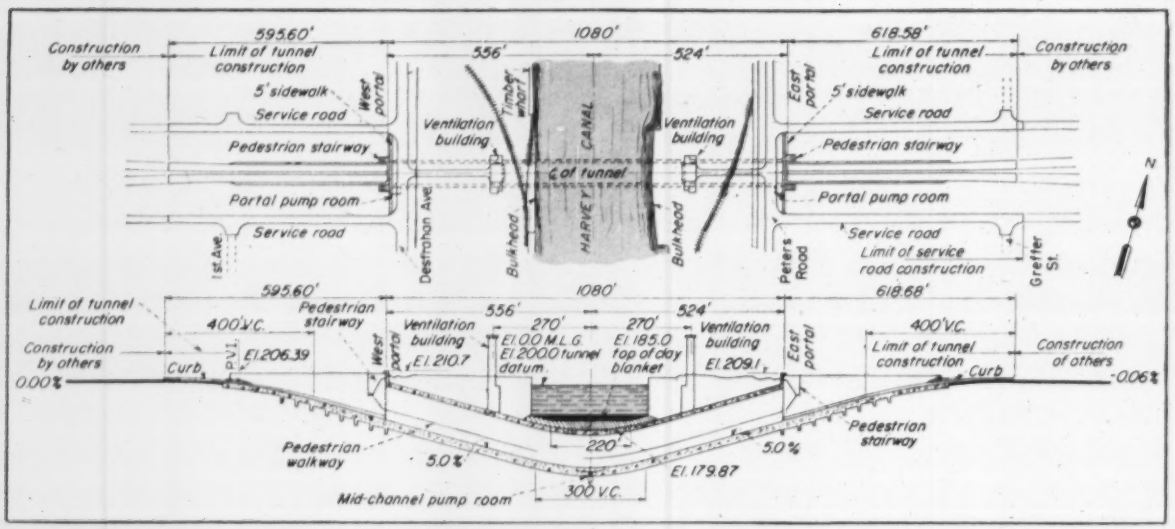
The tunnel section has an overall width of 65 ft, heights of 20 ft 10 in. above the sand slab, sidewall thickness of 2 ft 6 in., minimum soffit thickness of 2 ft 8½ in., increasing toward the walls, maximum invert thickness of 3 ft 7½ in. under crowns of roadway. It provides two eastbound and two westbound roadways, each 22 ft wide, divided by the 2 ft thick center wall.

Inside vertical clearance is kept at 14 ft 6 in. above crowns, slightly decreasing to 14 ft at the curbs which rise 9 in.

Two walkways, 4 ft 6 in. in width are provided along the righthand side in each direction.

The rectangular air ducts, with 22 sq ft cross sections, are located under each walkway, to deliver fresh air through flue ports just above the side curbs.

• **Subsurface tough**—Although subsurface conditions are considered quite usual by local construction men, any work in the water soaked mixture of decayed vegetable matter, river silt,



PLAN AND PROFILE indicate designers' solutions, construction difficulties. Connecting roads have been completed for local traffic, while remainder of expressway is being built.

blue clay and ancient cypress roots that passes for "ground" in the area is difficult.

Soil borings indicated considerable variation in strata type and thickness. Broadly speaking, however, strata from ground level to about 40 ft down are mostly soft organic clays, often firmer near the surface. Below this are soft clays, often with sand or silt lenses, or loose sands, sandy silts, or silts still further down are soft to medium stiff clays with silt lenses and irregular strata of firmer clays and sands.

It was determined that open excavations in the dry should be limited to 10 to 15 ft in depth, depending upon location, to prevent failure of the slopes. In underwater excavation in the channel section, it was indicated that side slopes of 1½ to 1 would provide a minimum factor of safety against failure.

Additional conclusions were that cellular cofferdams, 65 ft in diameter with a maximum of 35 ft of granular backfill material in the top would be safe against failure by overturning, sliding, rupture of interlocks and vertical shear when the enclosed excavation was dewatered.

It was indicated that the soils at the base of the excavation in most locations could not support the weight of the unbuoyed structure during construction without base failure. Thus, piling would be required to support the structure during construction.

• **Design considerations**—The tunnel section was designed to withstand vertical dead loads of water at 62.4 lb per cu ft, of submerged sand at 70 lb per cu ft; concrete at 150 lb per cu ft; sustained lateral fluid pressures of 62.4 psf per foot head of water; lateral equivalent fluid pressure at 80 psf per foot head of wet fill. Additionally, the design called for a hydrostatic uplift equal to the head of water at the depth of the tunnel bottom.

Other design considerations included the fact that the tunnel must carry a four-lane AASHO H20-S16 land-loading, plus two walkways and support a Cooper E-60 live loading plus AREA impact applied as an equivalent surcharge of 500 psf where railroad tracks run over the tubes on both banks of the canal.

The entire structure was designed for 3,000 psi concrete.

To realize the design conditions of unyielding foundation, timber-bearing piles each developing a safe working capacity of 20 tons after penetrating into pleistocene clays were called for, with varying spacing to meet load requirements under different sections.

Because the sand slab would be subjected to hydrostatic uplift before superimposed load was in place, (under the cofferdam method) additional piles were required to hold down the sand slab. In fact, all the piles were used to resist uplift until gravity loads of the tunnel, backfill, and clay blanket became effective.

• **Construction methods**—The contractor—originally a joint venture of R. P. Farnsworth & Co., Inc. of New Orleans, and Silas Mason Co., Inc. of Shreveport—elected to construct the entire tunnel in the dry, within cofferdams. Stage Ia and IIa cofferdams were used respectively to construct the east and west bank sections, and Stage Ib and IIb cofferdams were used to construct the east and west canal sections of the tunnel.

Difficulties encountered in the Stage Ib cofferdam caused a long delay in completion. Sheetpiles pulled out of interlock, and caused considerable leakage when the area was drawn down, with resultant distortion and deflection of some of the interior bracing. Repair of the separated ares of the cells was finally effected by casting concrete segments between the master piles at the junction with the adjacent cells, with tie rods to take the hoop stress.

The Stage IIb cofferdam consisted of an outer and inner enclosure. The outer enclosure extended from the west bank of the canal to two corner circular cells on the center line of the channel. It had a width of 233 ft between centerlines of cells, and was constructed of shell-filled cells of 33 ft 11⅜ in. in driving diameter. Two corner cells on the canal centerline were left in place from Stage Ib and had a driving diameter of 30 ft 10¾ in.

The bulkhead at mid-channel consisted of permanent cutoff sheet-piling under the west end of the east half of the canal section of the tunnel, and a temporary end wall which was left in place while the changeover was made from east to west side.

The inner cofferdam for Stage IIb had a clear inside width of 75 ft—compared to an overall tunnel width of 65 ft—and was constructed of steel sheetpiling of 60 ft length, with its bottom penetrating 4 ft into pleistocene clay.

Top and bottom wales and transverse and longitudinal top and bottom struts were of varying sizes and weights of wide flange beam sections, as re-

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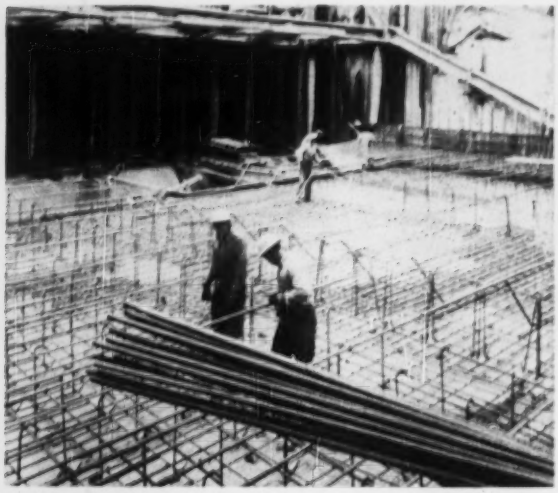
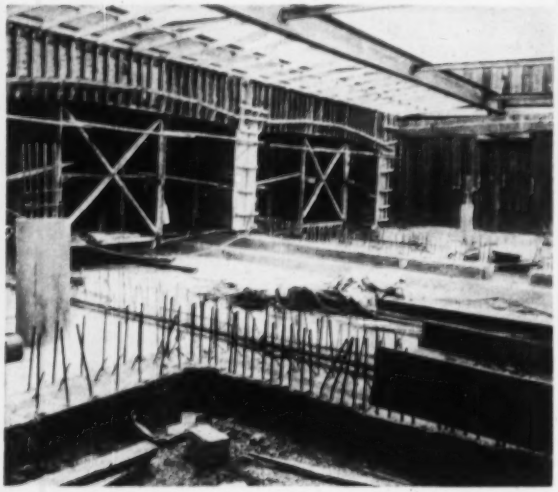


UNWATERED, inner cofferdam encloses workers placing reinforcing cage above slab placed on base material.



BRACES for the inner cofferdam frame the formwork for the tunnel barrels.

quired by saturated earth pressures and construction loads.

There were two lines of longitudinal struts; transverse struts were spaced at 20 ft on centers. Horizontal trussed bracings were installed at both top and bottom strut levels at the land and mid-channel ends of the cofferdam. Bottom struts were located 8 ft above the bottom of the sand slab to provide working headroom and top struts were 16 ft higher.

A temporary construction road, 20 ft wide, was built along each side of the inner cofferdam after the enclosed space between the outer and the inner cofferdams was dewatered.

In addition to the temporary cofferdam structures, dewatering and a total excavation of 153,000 cu yd, major items that went into the permanent tunnel structure included driving 3,520 timber bearing piles; placing 2,500 tons of reinforcing steel; and casting 39,200 cu yd of concrete. The piles used under the permanent saturation line were untreated, and treated piles were used below the end portion of ramps.

Three classes of concrete were used: The concrete was of 2,500 psi for sand slabs and concrete backfill wherever required; 3,000 psi for structural concrete with a thickness of 12 in. and over; 3,200 psi for roadway finishing slabs and in walls, columns and slabs less than 12 in. in thickness, and for all tremie concrete.

Tremie concrete was used inside the Stage Ib cofferdam to seal the bottom, after the piles had been driven, so that complete dewatering could be effected.

• **Slabs**—To secure accurate grade for subsequent placement of concrete for the tunnel barrel, a continuous 12 in. sand slab was placed over the prepared foundation and cut-off piles, up to 200 ft beyond each portal. Thence a 9 in. sand slab was placed to the ends of the ramps.

The base slab was placed in sections of 60 ft, and walls and roof in sections of 40 ft. All transverse construction joints were formed with keys all around the section, including the center wall. Longitudinal keyed construction joints were located near the top and bottom of walls and construction joints were at top and bottom of the air duct walls.

Water and air lines were laid in the air duct walls and fiber conduits imbedded in the roof above the haunches.

Inside the tunnel, the wearing course of the roadways was placed directly over the base slab, with a 4½ in. thick concrete fill, reinforced with wire mesh, with transverse dummy joints spaced 20 ft on centers. Along each curb, there is a 3 in. dia semicircular gutter and a longitudinal joint filled with tar-saturated felt.

Roofs and walls above the curb level are white tile with blue tile trim.

To keep the tunnel watertight, a four-ply membrane waterproofing with 2 in. of pressure-placed concrete was applied under the bottom structure slab and over the roof and exterior walls, with the exception of the center 330 ft, where ¼ in. steel plate waterproofing and 2 in. protective concrete were used to serve as armoring and as added protection against any possible sunken ship or overdredging.

• **Automatic operations**—The heart of the tunnel's automatic operation lies in the provision of ever-functioning electrical power systems and automatic change-over.

Power for lighting, ventilating and pumping is supplied from two feeders by the Louisiana Power and Light Company. To supplement the primary source of power, there is an automatic starting emergency diesel generator set rated at 269 kva. Upon loss of voltage from the normal line source through one of the feeders, a breaker automatically opens and feeds power from the second feeder. Should both line sources fail, the diesel generator set would automatically start to take the load. As soon as either line source is restored the diesel engine shuts down. Each transformer bank is sized for full tunnel load.

Additionally, a battery supplies power for tunnel emergency lighting motor generator sets, traffic signals, circuit breaker operations, and miscellaneous control and alarm equipment.

To cope with heavy sudden rainfalls, there is provision for removal of storm runoff from the open ramps and for discharge of water from possible seepage or from washing down the tunnel. In the area, the maximum recorded rainfall equals 5 in. per hr with a maximum 5 min intensity at the rate of 11 in. per hr.

The east and west portal pump rooms, respectively serving drainage areas of 32,200 and 31,000 sq ft, are each equipped with four pumps, each delivering 500 gpm against a total head of 55 ft. Sump storage of 17,550 gal. is provided at each portal. Three pumps can discharge the design storm runoff, the fourth pump is a spare for maintenance and rotation of pumping sequence.

The mid-channel pump room contains four pumps, each delivering 200 gpm against a head of 95 ft. All

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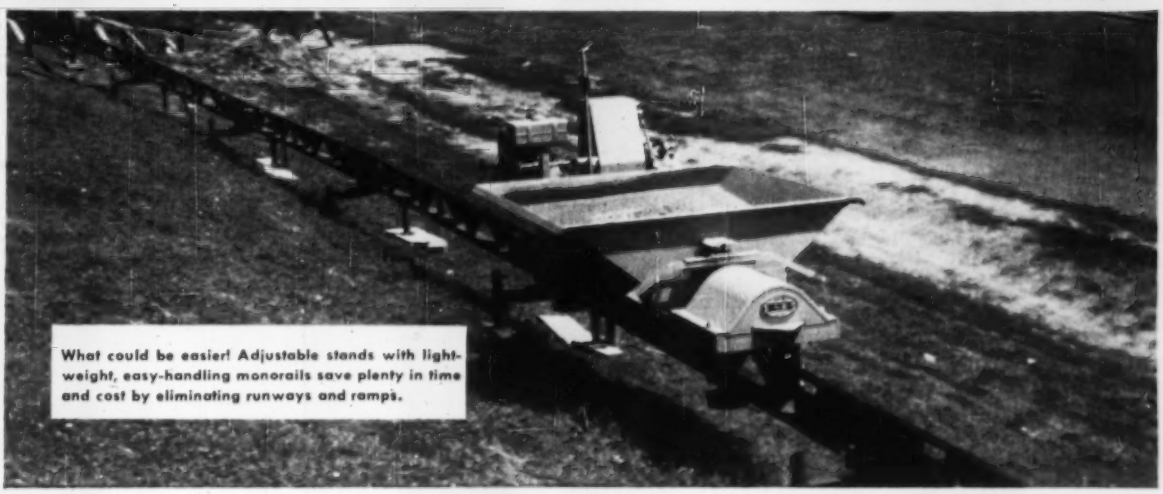
500′ nonstop from mixer to pouring site. Note end of Railporter monorail system in lower left foreground ...and its long travel path to end of stadium tiers and up grade in far background.



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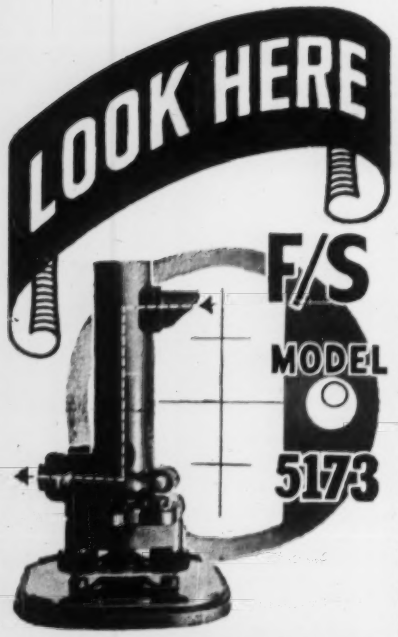

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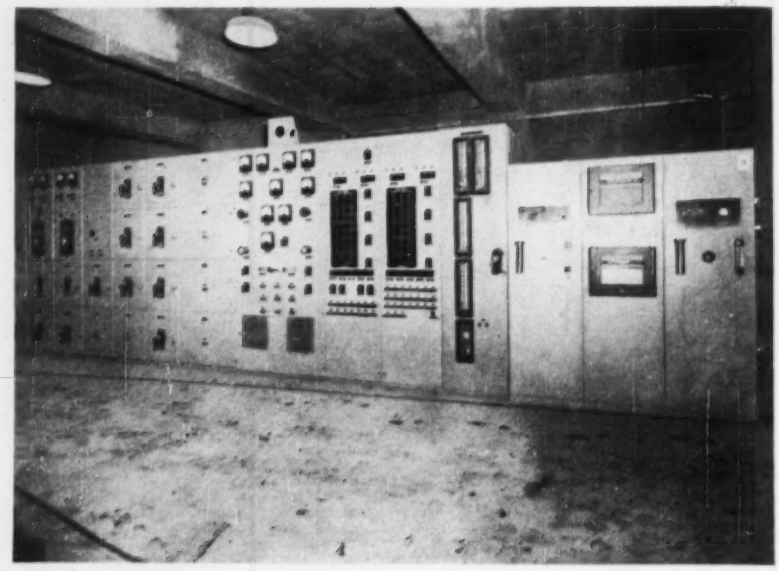
. . . Tunnel unlocks traffic maze



HEART of automatic tunnel operations—lighting, ventilation, pumping—is control panel.

pumps are of the vertical centrifugal type and are equipped with automatic electrode water level control. They start automatically and successively in preselected sequence as the water level rises in the sumps.

• **Lighting system**—The transition of light intensity between the portals and mid-channel is so graduated that the motorist does not notice any change, although he is in reality experiencing 6.3 times as much light at the entrances as at mid-channel. The fluorescent lights are placed and shielded so that only the glow is visible, and the lights adjust themselves to the demands of sunlight and tunnel light through automatic controls.

Main lighting is provided for the full length of the tunnel with an illumination intensity of 13 foot-candles. Supplementary lighting for 150 ft. at entrances provides 14 to 82 foot-candles. Ramp lighting is set at 4 foot-candles.

Fixtures inside the tunnel consist of fluorescent tubes, each 6 ft long, with 145 two-tube fixtures which have been placed in one continuous strip in each two-lane traffic tube.

• **Ventilation**—Fresh air is forced into the tunnel by a series of eight working fans and a spare unit of vane-axial type, installed in two ventilation towers at quarter points. The exhaust air is forced out the portals.

Operating under usual conditions, air in the tunnel is completely changed about every 2 min.

The ventilation system is designed to provide longitudinal uniform supply of fresh air to each quarter section of each roadway through the entire 1,080 ft of the tunnel. Both manual and automatic fan speed controls are provided; two-speed manual control at the fan starters, and two-speed automatic control actuated by program clock and by carbon-monoxide analyzer.

• **Traffic control**—Traffic movements through both tubes are controlled by separate traffic signal lights for each of the two lanes in each direction at both ramp and portal entrances.

Besides reflecting signal indication on the control board, there are emergency manual control stations in each tube at the east ramp, east portal mid-channel, west portal, west ramp, and on the control board. These manual stations control all the signals located in each lane of traffic.

In addition, automatic control is initiated by fire alarm, high carbon monoxide, mid-channel high water, or one hour of motor-generator set DC operation, to turn traffic lights to red automatically.

• **Credits**—During the course of the contract, the name of the contractor group was changed to R. P. Farnsworth & Co. Inc., and Mason & Hanger-Silas Mason Co., Inc.

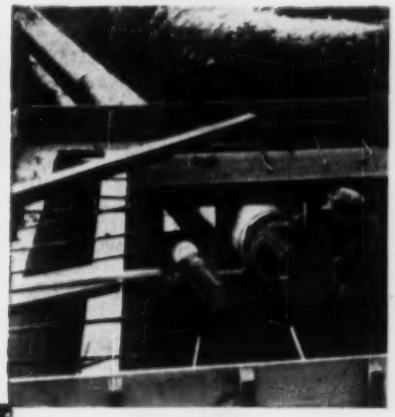
The project is under jurisdiction of the Louisiana State Department of Highways, of which Robert B. Richardson is director and Ernest J. James, chief engineer.

R. B. Jewel, vice-president and deputy chief engineer, was project manager in overall charge of the work for the contractors.

MR. ENGINEER:

LET'S FACE THE FACTS . . .

How can an underground piping system be watertight when you can't *AIR TEST* it?



Test caps applied to unit ends for air testing full-welded conduit system.

During air test, conduit field welds are checked with soap solution.

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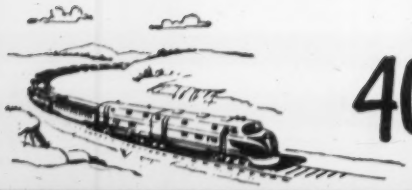
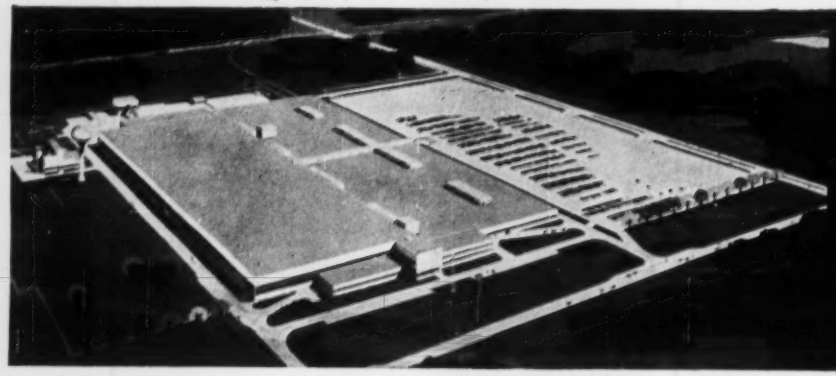


40 Carloads of Republic Steel Pipe



30 CARLOADS

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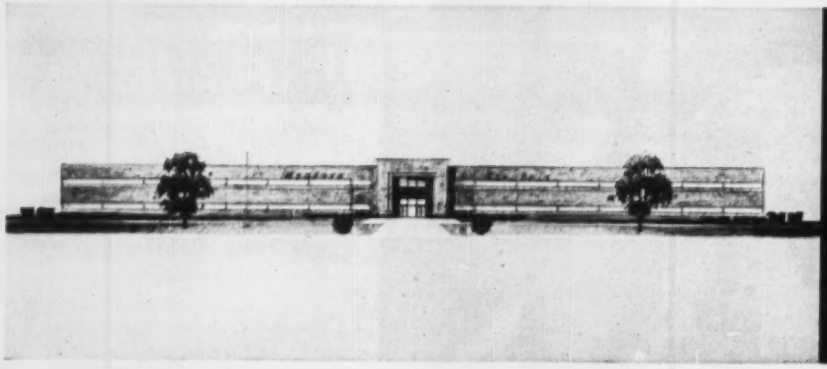
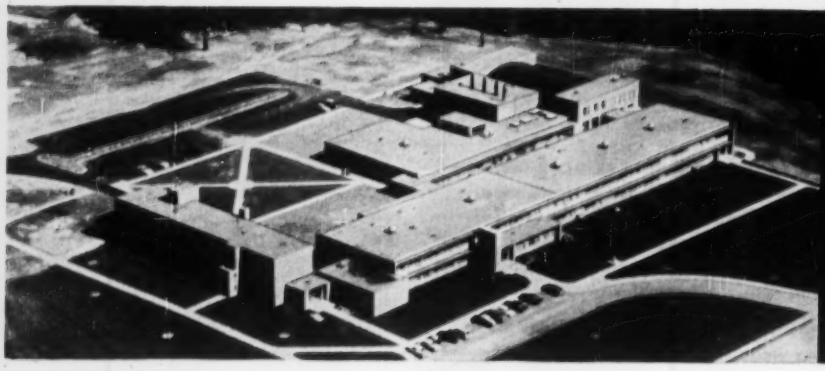
Architect & Engineer—Albert Kahn,
Associated Architects & Engineers,
Consultants—Hunkin-Conkey
Construction Co.
General Contractor



6 CARLOADS

Western Electric Company
Distribution Center—Solon, Ohio
Lockwood-Greene Engineers,
Architects
Albert M. Higley Co.
General Contractor



4 CARLOADS

Magnificat High School
Rocky River, Ohio
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MEET MODERN PIPE SYSTEM REQUIREMENTS WITH TRADITIONAL ECONOMY AND DEPENDABILITY

40 carloads of steel pipe—100% Republic—were installed by the Gorman Lavelle Company, Cleveland, Ohio, in these three up-to-the-minute buildings. Used for service, supply and waste lines, Republic Continuous Weld Steel Pipe assures a lifetime of economical, minimum-maintenance operation.

Republic's unexcelled reputation for quality, plus fabricating "know-how" of contractors like Gorman Lavelle are an effective combination in fighting inflated construction costs. Through years of installing steel pipe, techniques in cutting, threading, bending and welding have reached a high degree of efficiency. These factors, plus pipe products tailored to the job, give building owners maximum system dependability at lowest installed cost.

No question about it—to meet modern pipe system requirements with traditional economy and dependability, it will pay you to specify Republic Continuous Weld Steel Pipe. Available in a full range of sizes. Contact your local distributor or Republic representative. Or mail coupon for complete information.

REPUBLIC CONTINUOUS GALVANIZED SHEET provides dependable corrosion resistance at rock bottom initial cost. Its uniform, tight zinc coating won't crack, flake or peel under any forming operation permitted by the base metal. Republic Continuous Galvanized is ideally suited to ductwork, shown above, as well as countless other commercial, industrial and residential applications. Send coupon for details.

REPUBLIC ELECTRUNITE® E.M.T. combines several exclusive advantages that mean significant savings in electrical raceway system installations. First, "Inch Marks" simplify cutting and fitting. Second, "Guide Line" keeps bends in correct plane. Third, "inside knurling" makes wire pulling up to 30% easier. These features in the popular sizes, plus ELECTRUNITE's uniform quality, are your assurance that, "the best costs less installed."

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Latest Features
Air Conditioned Throughout
Walls of Sealed Windows Designed For Maximum Comfort and Productivity

Modern In Every Respect . . BUT ONE

No ladders. No climbing through windows. No risky dependence upon belt or eyebolts. This man is safe. He is surrounded by a guard railing. His equipment is located conveniently. All windows are quickly reached by electric drives (manually-operated equipment also available). He can clean many more windows per day.

YES, this fine new plant is lacking in one important respect. No modern, safe, efficient means has been provided for washing the windows.

Today's buildings use more glass than ever before. Windows in air-conditioned buildings are often set solid with no means for opening. Washing windows has become a big job, far too much for slow old-fashioned methods.

Cleveland Tramrail window-washing equipment offers a solution to the problem. It consists of a track at the top of a building, supported either by the roof overhang or by brackets attached to the wall, and a cage which can be traveled along the track, as well as be raised and lowered to any height. All windows can be reached and washed easily by one or two men working within the cage.

Many buildings are now equipped with Cleveland Tramrail window-washing systems. They speed the work, cut costs and are an important aid to safety. The same equipment is also helpful for the inspection of exterior walls, pointing, calking, glazing, painting and other building maintenance.

When installed on new air-conditioned buildings, permanently fixed windows may be used instead of the more costly opening type, thereby netting savings often large enough to cover the entire cost of the equipment.

For further information write for Booklet No. 2022A

CLEVELAND TRAMRAIL

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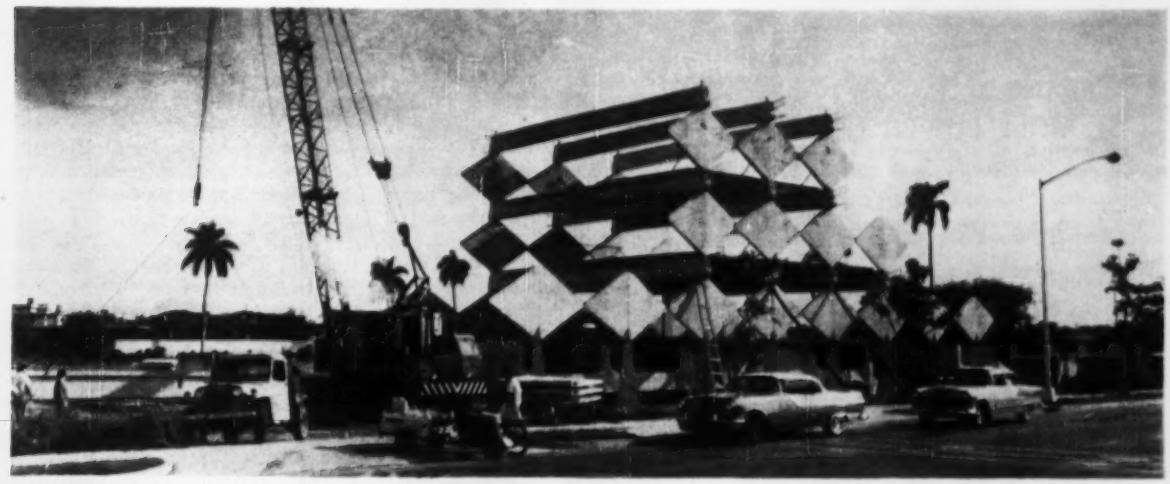
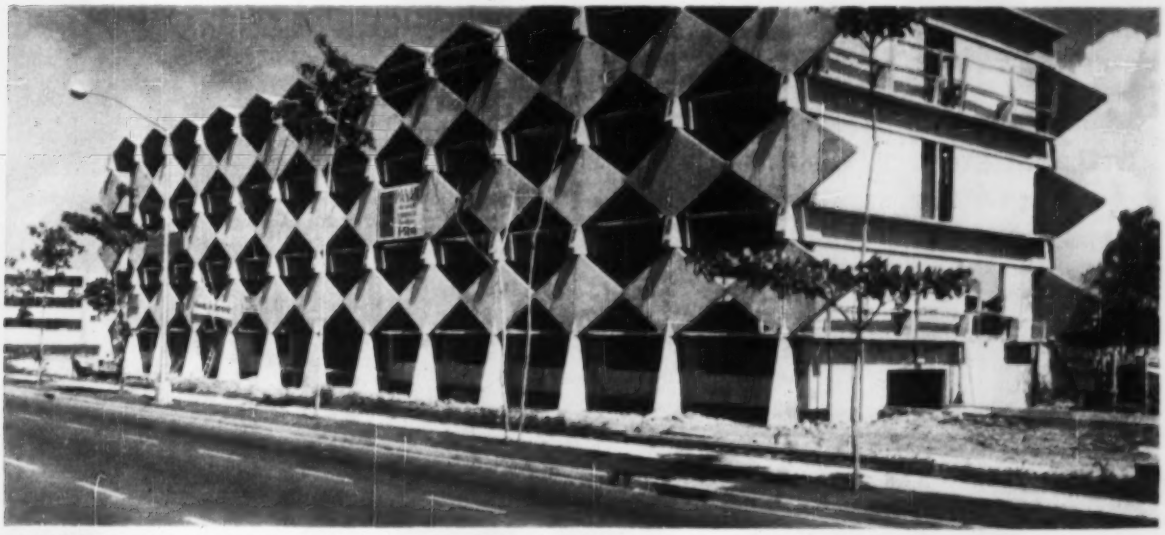
CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. •



PYRAMID of diamond-shaped columns and prestressed beams forms the start of the framing for a laboratory building in Havana.



RHOMBUS columns serve also as facades of the building. Behind them will be erected a wall of aluminum and glass jalousies.

Laboratory Gets Unusual Facade

A concrete laboratory building, four stories high, being constructed for the School of Engineering, University of Santo Tomas de Villanueva, near Havana, Cuba, has unique columns. Spaced about 16 ft c-c along the long sides of the building, they look like diamond-shaped slabs standing on one corner.

The designers paid special attention to the exterior appearance of the building, to make it attractive enough to merit the prominent site it occupies. It is located on Fifth Ave., one of the most important arteries leading to the residential section, Reparto Biltmore, just outside Havana. The objective was achieved with an unconventional design.

A typical floor is 196 x 46 ft, with the long sides facing north and south. In the center, bisecting the long, narrow structure, are stairs and foyer. There are no columns in the interior; so the school has full freedom in subdividing the space.

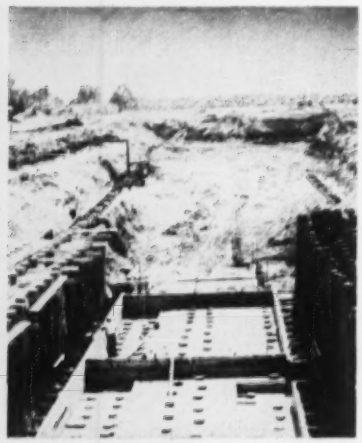
The columns are located along the north and south sides, beyond the edges of the floors. But they are not conventional prismatic compression members. Giving the facade the unusual effect sought by the designers, each column is a rhombus, or diamond-shaped, precast, reinforced concrete slab. Behind the unusual columns and visible through the spaces between them is a glass-jalousie and aluminum wall, with plastic window sills.

• **Novel framing**—At the bottom of the building the rhombus slabs are seated on their bottom corners on story-high, slender, precast concrete pyramids. On the top corner, each slab supports a 58 ft long, prestressed concrete girder that spans the width of the building.

The girder, in turn, supports on its

HOW TO HANDLE
WET JOBS

PLANT McMANUS,
GEORGIA POWER CO.
Brunswick, Ga.
Contractor: Standard Construction Co.



WELLPOINT ENGINEERS LICK
MARSH AREA PROBLEM

PICTURE A RIVER nearby . . . a subtropical site so marshy that the ground shook like jelly beneath the machines. To these obstacles, add a water table almost at surface and, farther down, some layers of muck 2 to 3 ft thick.

• Such was the problem pitched at Griffin engineers and here are the answers they returned, with a carefully planned 2-stage wellpoint system. (1) Foundations go in quickly, as deep as 22 ft below water level. (2) Over 22,000 cu yds of earth move out economically, by dragline. (3) Subgrade is so bone-dry that the 1800 timber piles are driven with pile rig working from bottom of excavation.

• When a job calls for "know-how," call for Griffin, dewatering experts for nearly two decades.

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WELLPOINT CORP.
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top flange the column above. At the top of the building, however, the girders carry the roof, which consists of an inverted-V slab in each bay. The roof was cast in place, then coated with waterproofing paint.

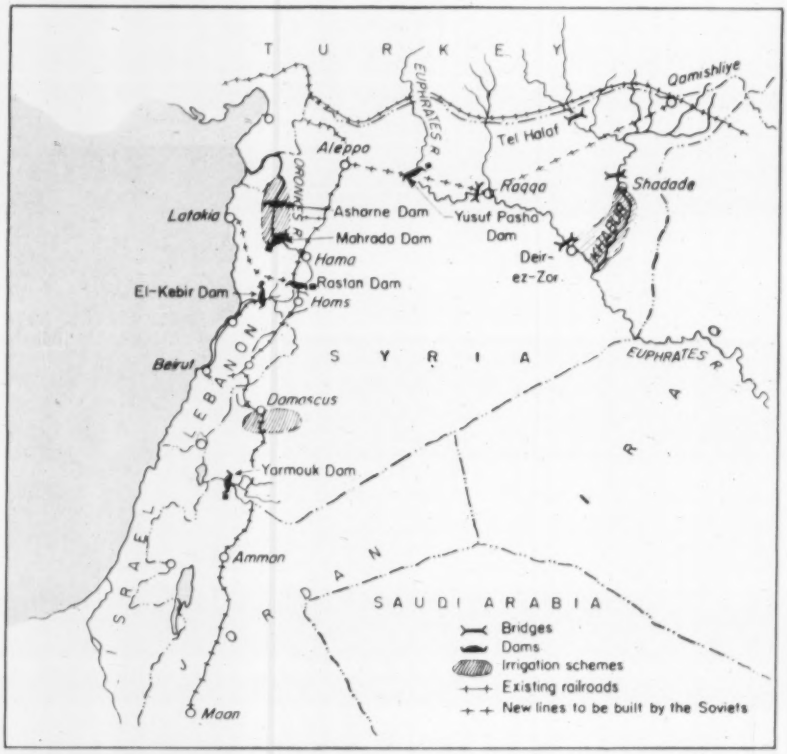
The rhombus slabs are interlocked with each other and with the pyramids and prestressed girders. At top and bottom, the tie was made with a hollow, square steel dowel that projected above the lower member into a hole in the member being seated. Adjoining corners in each tier were connected with steel dowels encased in mortar.

The girders are precast I sections, 42 in. deep. They were prestressed with six high-strength 1⅛ in. dia steel bars, which are anchored at girder ends with steel wedges. The bars are curved in a vertical plane to vary the prestress.

The girders support precast concrete floor slabs, 16 x 5 ft by 6 in. thick. A top surface of terrazzo was cast integrally with the slabs.

The short walls of the building on the east and west, as well as vestibule walls, which were designed for wind shear, and interior partitions are built of concrete blocks faced with mortar.

Manuel R. Gutierrez was the architect and Mario G. Suarez, the consulting structural engineer. Fernando Munilla was the contractor. Prestressing steel was supplied by Stressteel Corp., Wilkes-Barre, Pa.



SOME OF THE SLATED PROJECTS for Russian aid under the recent Soviet-Syrian economic and technical assistance agreement.

Soviet-Syrian Pact Lists Projects

The recently ratified Soviet-Syrian economic and technical assistance pact contains an annex listing a definite 19 Syrian projects—12 of them public works—which will be carried out with Soviet economic and technical aid. While no costs are mentioned, it is estimated that the Soviet loan will amount to $100 million and the cost to the Syrians will be over $350 million.

The agreement calls for each step of every project to be carried out by the Soviets from beginning to end. All the Syrians will have to do is supply local labor and pay the bills in 12 annual installments at 2.5% interest after the start of each project. Immediate execution of the projects is not expected since each will have to be authorized after special and separate agreements between the two countries.

None of the 12 public works projects is new. Earlier studies by the International Bank for Reconstruction and

ND FACTS

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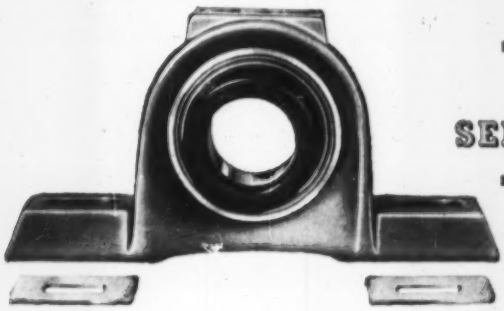
- New Departure adapter ball bearings are sealed and lubricated for life.
- Design is compact and rigid—fits easily in limited space.
- No grease nipples or other protruding lubricating fixtures needed.
- Pillow blocks are easily mounted without need for any special tools.
- New Departure ball bearings are high capacity, precision-built for long life.
- Bearing and block surfaces are spherical to accommodate any misalignment.
- Thirty-two shaft sizes, $\frac{1}{2}$" through $2\frac{15}{16}$", for wide variety of applications.
- Interchangeable with most other makes of pillow blocks.

Bearings are easily applied to shafting and are positively locked in position with eccentric cam locking collar and set screw.

Elongated bolt holes designed to accommodate practically every type of spacing for hold-down bolts.

Mounting pads are furnished with each New Departure Pillow Block to assure easy interchangeability with all pillow blocks having a high base-to-center dimension.



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BALL BEARINGS

New Departure Pillow Blocks employ performance-proved Type AE adapter ball bearing with Sentri-Seals for long-life protection against dirt or grease leakage.

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1908–1958 GM FORWARD FROM FIFTY

NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

Development and also by various Syrian government departments have noted them as vital for the country's economic development.

The projects listed include railroads and highway bridges, water storage and hydroelectric dams, and irrigation systems, with the transportation jobs expected to get top priority.

The most impressive and far reaching projects are the river projects. These include dams and power plants on the Euphrates, Khabur, Orontes, El-Kebir, Barada and Yarmouk Rivers.

One big hydroelectric development will be a dam and powerhouse with a 100,000 kw capacity on the Euphrates River. It probably will be at Yusef Pasha, 40 miles from the Turkish border, and in its initial stage is to be about 2,000 ft long and 65 ft high. Final stage will go to 98 ft with a water storage of over 1 million acre-ft.

The agreement calls for a series of small dams and power stations on the Orontes River, which flows through the Ghab marshes. Listed are a reservoir for flood control and irrigation at Asharne and dams and power stations at Rastan and Mahrada.

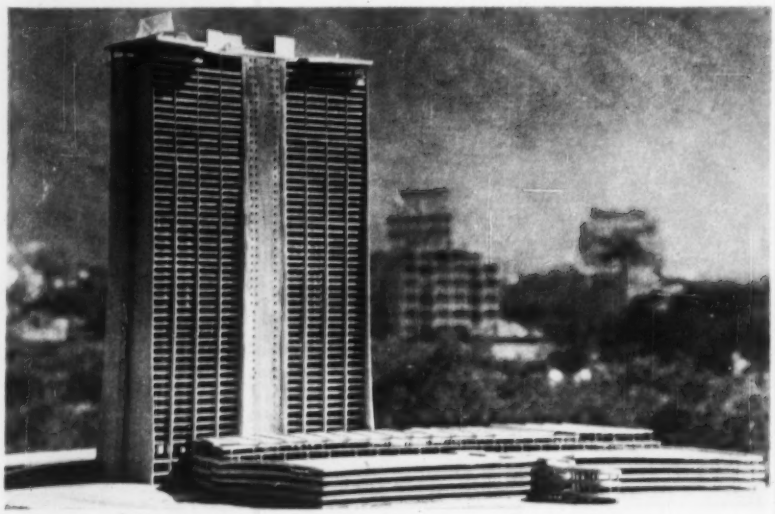
Harnessing the El-Kebir River for "the production of electrical energy" is another phase of the pact. (The World Bank survey in 1955 had proposed a small dam on El-Kebir to hold flood water for irrigation and a power plant with a capacity of 2,500 kw.)

A dam and power plant on the Yarmouk River also is listed, to have a capacity of 6,000 kw.

Thermal power is included in the agreement with stations of 15,000 kw each planned for Aleppo and Damascus, and another in the region of Homs with a capacity of 3,000 kw.

In addition to the dams and hydroelectric projects, the agreements calls for extensive irrigation networks for the Euphrates, El-Kebir, Orontes, Barada and Khabur River, to irrigate 175,000 acres in the Ghab Valley and 300,000 acres in the other river basins.

Transportation schemes listed in the agreement include a 300 mile railroad from Qamishliveto Aleppo; a 94 mile railroad from the Homs-Attari line to the port of Latakia; construction of two highway bridges across the Khabur River near Tel Halif and Shadade; reconstruction of a highway bridge near Raqqa and another at Deir-ez-Zor, both on the Euphrates.



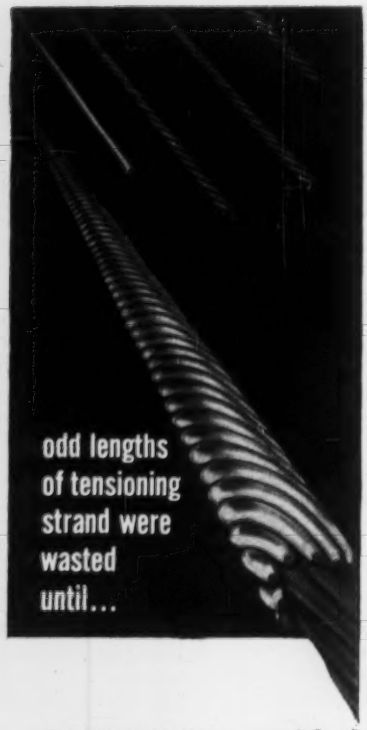
Caracas Erecting Tallest Concrete Building

A $9.3 million contract has been awarded in Caracas, Venezuela, for construction of the world's tallest reinforced concrete building. It will be 58 stories and 614 ft high (model above).

A rental office and apartment structure, the building is part of a $52 million development of University City Institute. Among other buildings in the project will be a hotel, theater and shopping center. The development also will include a bridge across the Guaire River and parking for 3,200 cars.

The new skyscraper will be serviced by 32 passenger elevators, six moving stairs and two freight elevators. It will provide 1.9 million sq ft of floor area.

Architect of the building is Carlos Raul Villanueva. Project director is Jesus Arcia Casanas. Construcciones Dof Corp., of Caracus' is building the skyscraper.



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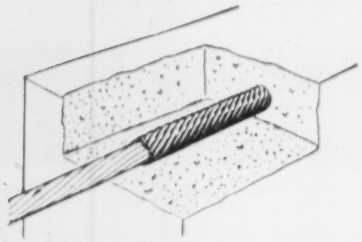
Now, Preformed Splices are used for splicing the strand used in pre-stressing concrete. You can salvage odd lengths of strand or save the strand when a wire breaks. Preformed Splices hold the full-rated strength of the strand and are available in the same material as the strand.



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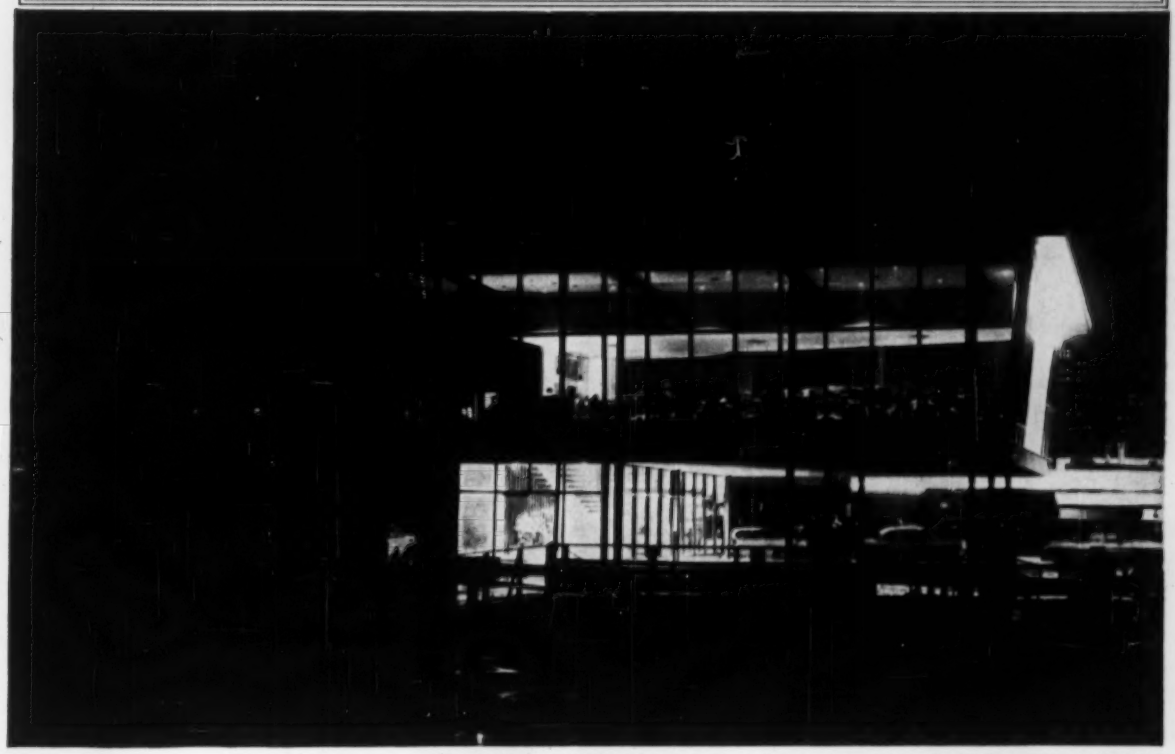
Made in accordance with or for use under U. S. Patent Nos. 2,609,653, 2,275,019 and 2,587,521. Other patents pending.

ON THE NEWS FRONT WITH STRUCTURAL STEEL



Architect: Hewitt C. Wells; structural engineers: John J. Gould and H. J. Degenkolb; steel fabricator: Schrader Iron Works; contractor: Charles O. Jones.

Steel, glass, and redwood on Fisherman's Wharf

Designed with most of its steelwork exposed, the Franciscan Restaurant strikes a bold and appealing note in a colorful setting on San Francisco's waterfront. With accommodations for nearly 200 patrons on three levels, a fine view can be had in nearly all directions from the glass-enclosed upper floor.

Bethlehem eight-inch wide flange columns are bolted to foundation plates imbedded in the concrete mat which is seated above the water on new piling. The use of structural steel for both functional and decorative purposes allows maximum use of floor space and conveys an impression of both rigidity and lightness.

A floating stairway, fabricated by welding channels and plate, connects the glass-enclosed entrance on the ground floor to the upper level. Redwood planking adds a contrasting touch to both interior and exterior.

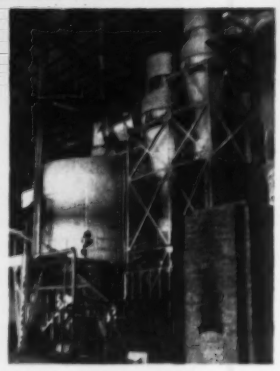
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Dowa Mining's Kosaka hydro-metallurgical plant where Dorrco FluoSolids System roasts 83 metric tons of complex copper-zinc concentrates per day.



One of two 20 ft. dia. FluoSolids Reactors roasting 235 metric tons per day of crushed pyrrhotite ore at Dowa's Okayama Plant.

Fluidization—
key to maximum utilization in Japan

Processing copper bearing pyrrhotite ore, the Dowa Mining Company at the Okayama, Japan plant is producing . . . and all from the same raw material . . . sintered iron ore for blast furnace use, cement copper and sulphuric acid.

Of major importance in this unique installation is the Dorrco FluoSolids System. Utilizing the proven principles of fluidization, the crushed raw ore is roasted under controlled conditions in the System . . . providing SO_2 gas for contact acid manufacture . . . Roaster calcine is acid leached for copper recovery and leach residue is sintered as blast furnace feed.

Dorr-Oliver in conjunction with our associates in Japan, Sanki Engineering Co. Ltd. of Tokyo, have collaborated with Dowa Engineers before. At Dowa's hydro-metallurgical plant in Kosaka, Japan, the Dorrco FluoSolids System is a prime factor in the world's first successful roasting of copper and zinc with electro winning of both metals.

For detailed information on D-O equipment and services involving the separation of finely divided solids in suspension or fluid techniques, drop a line to Dorr-Oliver Inc., Stamford, Connecticut.

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Italian Road Rushed

Milan to Naples highway has deadline for 1958

First sections of the all-new, 460-mile, Milan to Naples "Highway of The Sun" will be completed by the end of 1958. First to be ready will be the Milan-Bologna and Capua-Naples sections, which total 150 miles.

The turnpike-type highway should be half completed by the end of 1959 and in full service by 1963. At present close to 7,000 men and 2,000 machines are being employed.

The road will pass through Florence and Rome, connecting with other important highways along the way. The distance from Milan to Naples will be cut by about 70 miles, reducing the travel time—at top speed all the way—to six hours. That is almost three hours faster than the swiftest train. Speeds up to 100 mph will be permitted on the Milan-Bologna and Capua-Naples sections and 80 mph on the remainder, with the exception of the Bologna-Florence stretch.

The highway will require 304 bridges, the largest crossing—about 0.8 mile long—will be at the Po River. In addition, some 3,800 overpasses and 63 tunnels will be required. The longest tunnel will be 2,100 ft.

The road will be almost 80 ft wide, with a 10 ft center mall planted with shrubbery. Ten ft wide lanes—one on each side—will serve motorcycle and scooter traffic.

At the tunnels, the road cross-section will be different. Separate tunnels will be provided for the two directions of traffic, the side lanes and islands eliminated. The steepest gradient rise is designed at 3.75%, and the minimum curve radius, about 825 ft, occurs between Bologna and Florence, in three places. Along this section, speed will be limited to 60 mph.

Some 19 access areas will be provided along the route, together with 17 service stations, all located close to the access points. The handling of tolls will be similar to latest U. S. methods, with the driver receiving a card at point of entry and paying the toll at point of exit. All entry and exit stations will be off the main roadway. Five parking places will be distributed along the 120 mile Milan-Bologna section and 15 along the 53 mile Bologna-Florence stretch.

Total cost of the project will amount to about $300 million. It is estimated a total of 1½ billion cu ft of earth will be moved, and roughly 100,000 tons of steel and 25 million cu ft of masonry used.

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growing with the gas and water industries

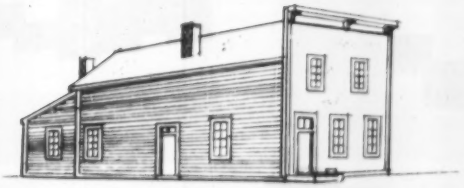
Founded in 1857, just one hundred years ago, Mueller Co. has grown steadily with the vital industries it serves.

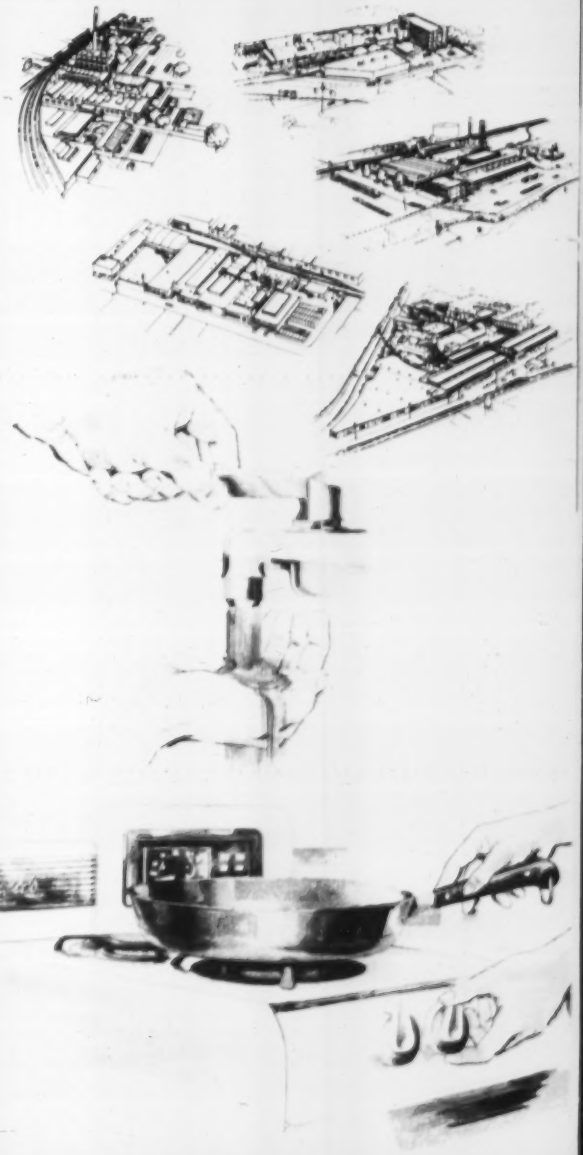
In 1857: Only one company in the United States was furnishing gas to its twenty-one customers; water sold for a penny a bucket from wagons; Hieronymus Mueller worked in a one-room, one-man shop in Decatur.

Today: Nearly 35 million Americans use gas for heating, cooking; more than 20,000 systems supply pure, fresh water to 130 million people; Mueller Co. is an organization with five modern factories, employing thousands of skilled craftsmen, manufacturing hundreds of quality products for water and gas distribution systems.

The water industry has made tremendous progress...the gas industry has had spectacular growth... Mueller Co. has kept pace with this march of progress!

1857 *1957*





engineering

New ideas—for new products and improvements on current products—are carefully analyzed and any with merit are passed on to trained project engineers for development. Approved designs are produced in the Mueller pattern shops by skilled craftsmen, and tested exhaustively—insuring performance in your equipment of tomorrow!

MUELLER ENGINEERS...

solving your problems of tomorrow–today!

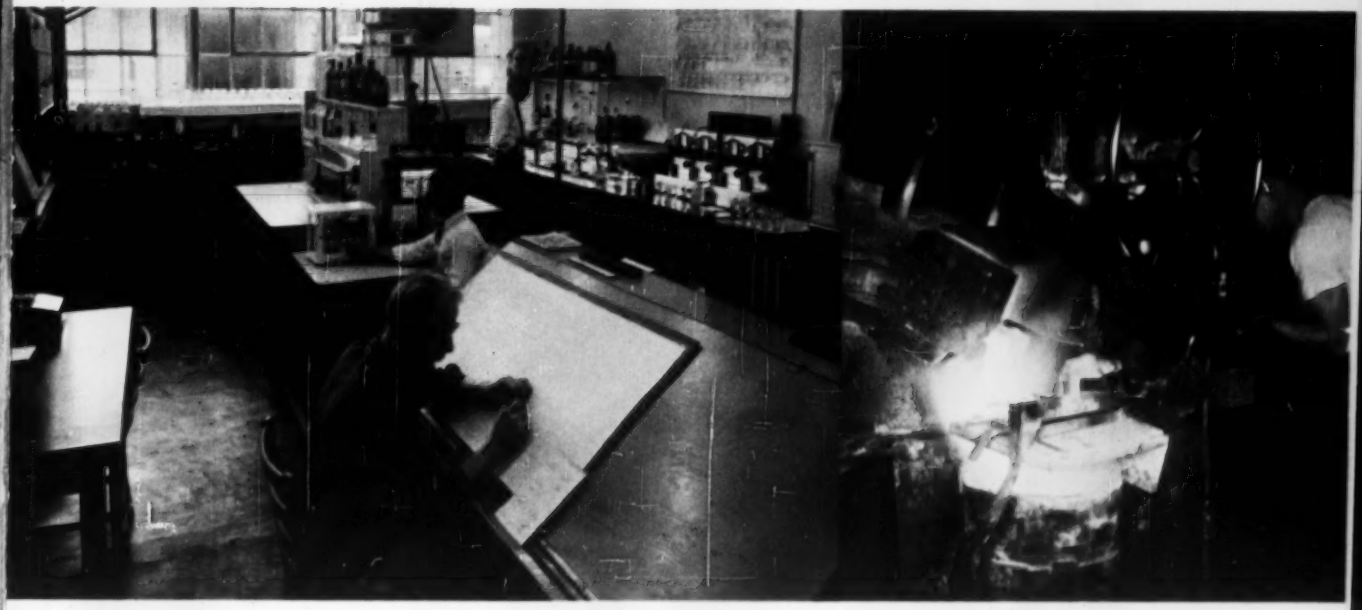
As a major supplier of the equipment used by water works and gas companies, Mueller Co. research, engineering and manufacturing facilities are constantly striving to solve your problems of the future...and the answers are being found! New products, methods and equipment are being developed, current ones are being improved to further aid the growth of our vital water and gas industries.

research

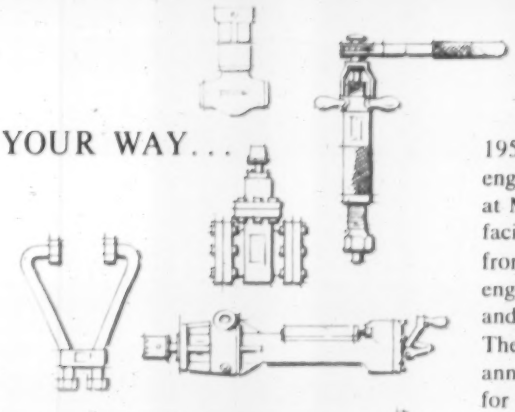
Metals, and other materials used in the manufacture of Mueller products, are subjected to rigorous tests and checks by laboratory technicians. This constant search is for improvements to provide longer life and safer operating methods in the products you are using today *and* tomorrow.

manufacturing

Production methods are under study at all times to gain greater accuracy and quality. New machine tools and equipment are constantly being added to Mueller plant facilities to add still more precision to Mueller products. Dependability—today and in the future—is assured!

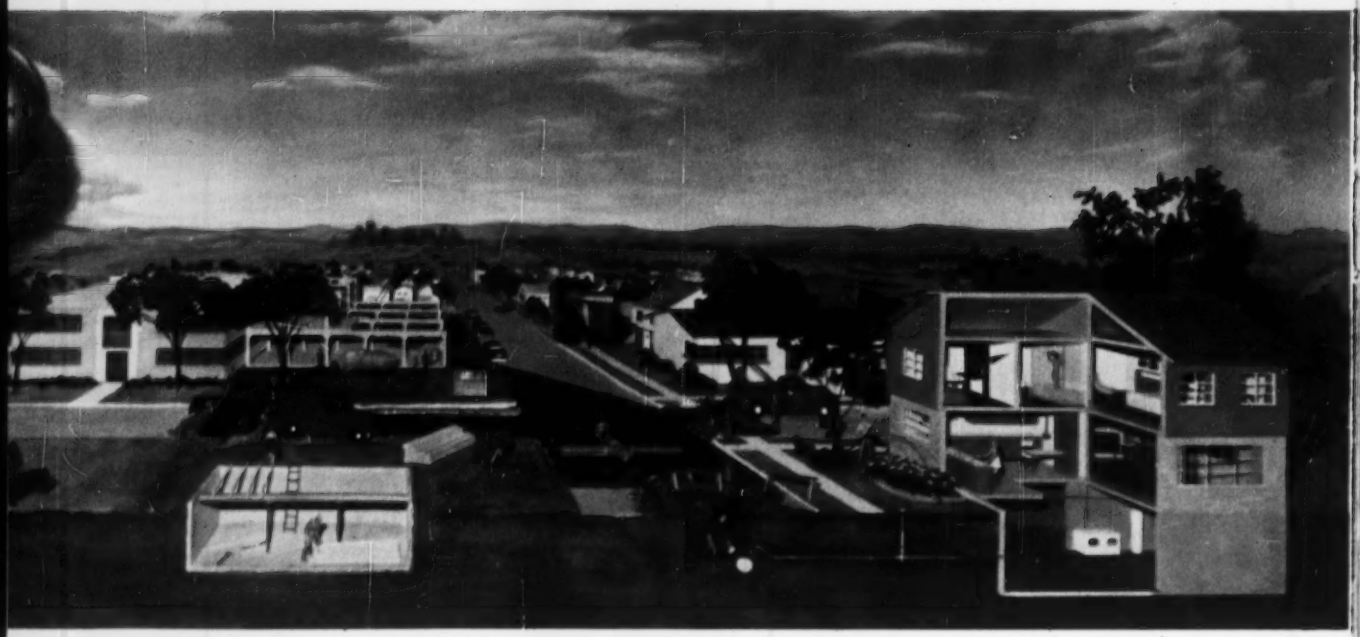


COMING YOUR WAY...



1957 was a year of spectacular engineering accomplishment at Mueller Co. New engineering facilities were dedicated and from the boards of an expanded engineering staff came new and improved products. These products will soon be announced, and will be ready for you in '58!

"Watertown, U.S.A."...is a miniature city produced by the almost-lost art of diorama. Each tiny detail is reproduced in exact scale for its position in the scene and is proportioned to correspond to the overall "bird's eye" view. The perspective of each item is exaggerated to create an optical illusion which amplifies the depth. Through this means, a view of approximately 20 miles has been reproduced in less than 48 inches.



unseen...unheard... UNDERGROUND!

Vital as the water and gas industries are, they receive little recognition for the vast facilities they must provide to serve their customers. Their products and their service systems lie underground—unseen and unheard.

Yet the story of these underground facilities is both dramatic and interesting to the general public. People have a more definite respect for the problems of the gas and water industries when they see the maze of equipment beneath their towns.

To help tell this story, Mueller Co. has prepared "Watertown, U.S.A."...a spectacular diorama that shows the work and facilities necessary to serve a community.

This is just one more way that Mueller Co. is looking to the future—the future of the vital industries which it serves!

MUELLER CO. **DECATUR, ILL.**

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario.

MUELLER CO. 100th YEAR SERVING the Water and Gas Industries QUALITY

Since 1857

Portable Mixer Can Be Wheeled Onto Jobsite

A portable mixer that can be powered either by an electric motor or gasoline engine is on the market. The unit, called Porta-Mix, has a 1½ cu ft capacity and is constructed on a wheelbarrow type frame that makes for easy wheeling onto the job.

Units can be equipped with either a stationary motor mounting or with an interchangeable mounting, called Power-All, which the company manufactures separately.

Blades attached to the inside of the drum for mixing concrete can be removed and replaced by a mortar and plaster mixing attachment. The entire unit can be tilted for easy pouring over a non-splash spout directly into the forms.

The manufacturer claims that the unit has advantages in small mixing jobs, particularly when the mix must be transported to a remote part of the job or poured in hard-to-get-at places. Graybill Industries, Inc., North 2907 Monroe, Spokane, Wash.

Adjustable Monument Can Raise With Roads

A survey monument with an adjustable top, eliminating the need of raising monuments to new road levels, is now on the market under the trade name "Mark-One."

The adjustable top feature is said to permit this monument to be easily and quickly brought to the new level without loss of accuracy of survey points.

The monument is designed for use in new or old concrete, macadam and other hard surfaces. Points on a resurfaced road are monumented by turning an established monument's adjusting screw and adding spacers. Up to 4½ in. of spacers can be added as required.

Mark-One is made of brass so that it will not oxidize or corrode even under extreme road conditions. A 14 in. pipe extends from the monument body into the sub-grade of the road below, providing a firm and permanent anchor. The monument will not weaken the pavement or freeze in winter, and has no lid to break.

According to the manufacturer, its height adjustability feature and sturdy construction end the problem of lost survey points due to resurfacing or wear. Charles Bruning Co., Inc., 4700 W. Montrose Ave., Chicago 41, Ill.

Hoist Carrier Features Extra Hoist for Dumping

A cab-controlled, 12,000 lb capacity twin-hook hoist carrier provided with an auxiliary hoist for dumping has been built of weatherproof-construction for outdoor service.

The unit will pick up tote boxes of materials, haul them and empty them by tipping. The carrier was especially designed for handling slag in a steel mill, but is suitable for a wide variety of materials such as castings, bolts, machines parts, sand and similar bulk items.

Hoisting and travel motions are controlled by the cab operator. The main hoist alone raises or lowers a tote box in the upright position with a speed of 35 fpm. Travel speed is 250 fpm and variable speed drum controllers are provided. Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., Wickliffe, Ohio.

Power Loader Offered for Utility Tractors

A front-mounted power loader for use on International 330, 350 and 350 Utility tractors now is available.

Known as the McCormick U-34B Power Loader, it can be powered either by the tractor's hydraulic system or with a special front-mounted hydraulic pump.

The new loader is adaptable to many loading, lifting, grading and material moving jobs by means of a variety of attachments. Among these are a standard 9 cu ft material bucket, a six-tine fork for bulky materials, and a tine cover that converts the fork into a material bucket.

A crane attachment and a 7 ft leveling and grader blade also can be used on the loader booms.

While regularly equipped with manual bucket control, the U-34B can be fitted with a two-way cylinder for hydraulic bucket control. International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

(New Products continued on page 82)

Square-shaped manhole and lid is . . .

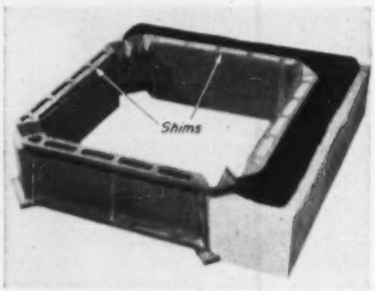
Rattlefree and Easily Shimmed

A square instead of the conventional circle, the Silent Knight Manhole boasts two features in particular: a lid that will never rattle and extreme ease in shimming the lid to keep it level with changing street surfaces.

A 7 in. high frame is cast in sizes to fit over 24 or 30 in. dia openings. The lid for the square frame is made up of two triangular halves, each provided with a three-point support. And with support at corner lugs only, no lid rocking can occur since contact between vehicle tire and lid must fall inside the lines of support, the manufacturer points out. The two lid halves are loosely held together by tie-rods underneath, allowing each half to find its own secure seat on the frame.

The lugs, which are wedge-shaped in vertical section, sit in V-shaped supports in the frame. Four of the supports prevent any motion in line with the diagonal bisecting the square lid, and two remaining supports prohibit motion in the direction of the diagonal. So rigid is this lock between the lid and frame that the manufacturers promises no wear on the lid support surfaces.

When the time comes for resurfacing the street, shims are provided to raise the lid so that it is continuous with the new surface. The shims come in halves and are bolted at the supports on the frame, then grouted to bond with the existing pavement. The new surface abuts against the heightened frame. The lid now sits on shims in the same way it did on the original frame. And shim can be added on shim for any number of times.



TWO SIZE SHIMS are shown bolted to original frame. Right half is 1¼ in. shim, which also is grouted to previous pavement and has new blacktop layer abutting. Left half has ¾ in. shim.

The manufacturer quotes a Cincinnati price of $43.60 for the 24 in. size Silent Knight Manhole. Shims, which come in ¼ in. increments from ¾ in. minimum thickness on up, are extra. The Silent Knight Co., 1614 N. Dixon Circle, Cincinnati 24, Ohio.

Automatic Blade Control Aids Grading Operation

A new automatic blade control for Caterpillar No. 12 motor graders is said to keep the grader blade at any desired slope and to have an accuracy of within ⅛ in. in 10 ft.

The manufacturer claims that because the control is far more accurate than the human eye and faster than the hand, the blade control permits an operator to finish a given grade in a single pass at higher speed and with extreme accuracy, when conditions enable the blade to carry all the surplus material. Finished grading often can be accomplished in less than half the time required with manual control of the grader. The control also may be used for finished bank cuts, sloping shoulders and working between forms to establish sub-grade.

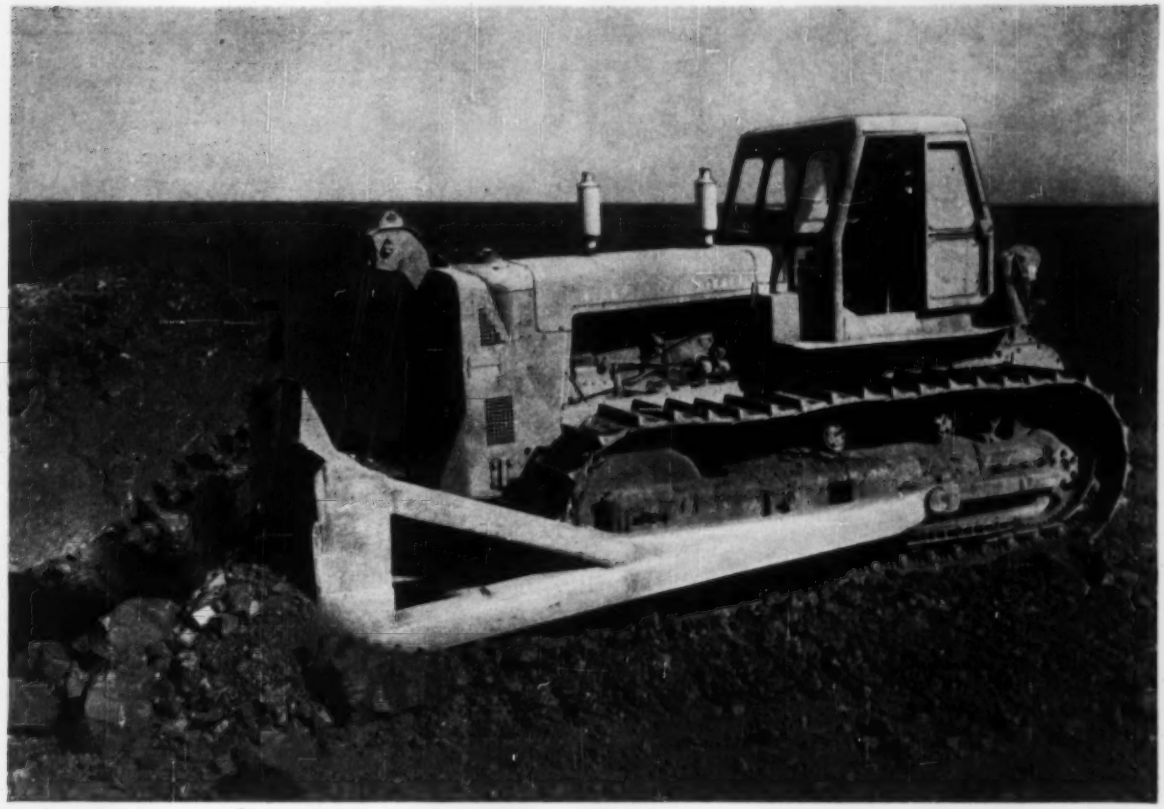
With the control installed on the controls panel, the operator simply dials the specified slope on the dial, which is calibrated in both percent of slope and slope ratio. The control holds the blade to this position regardless of the terrain and position of the grader frame. When manual operation is desired, the control can be overriden by the operator. Preco Incorporated, 6300 E. Slauson Ave., Los Angeles 22, Calif.

Resinous Cement Coating Helps Skid-Proof Roads

A resinous cement coating for roads is said to lessen vehicles' skidding tendency. According to the manufacturer, the coating permits automobiles to stop in half the distance usually required.

Basic ingredient is an epoxy resin made by Shell Chemical Corp. The cement is applied in layers ⅛ to ¾ in. thick at a top cost, estimated by the manufacturer, of $1.50 per sq ft for the average heavily traveled road. Reliance Steel Products Co., McKeesport, Pa.

(*New Products continued on page 84*)



How a midwest steel producer

TRIPLED TRACTOR-SHOE LIFE

It's "tough-going" in a slag pit! Heavy loads, the grinding impact of abrasive rock and metal, really put tractor shoes to the test. And that's exactly what this steel producer did.

Amsco® cast Manganese Steel Tractor Shoes were installed in place of rolled shoes. The result: *a 3-time increase in service life.* While rolled shoes had previously been replaced after one season's service, the Amsco pads lasted nearly *3½ years—a total of 3374 service hours.*

Here's further proof that Amsco Manganese Steel—"the toughest steel known"—can save you money and replacement time wherever severe impact and abrasion are a problem. Call your nearest Amsco representative, or write us direct, for further information on Amsco Tractor Shoes.

Amsco Manganese Steel Tractor Shoes
In addition to excellent impact and abrasion resistance, Amsco Tractor Shoes have countersunk bolts. This means less wear on bolts, often saves bolt-replacement when changing pads.

AMERICAN Brake Shoe COMPANY

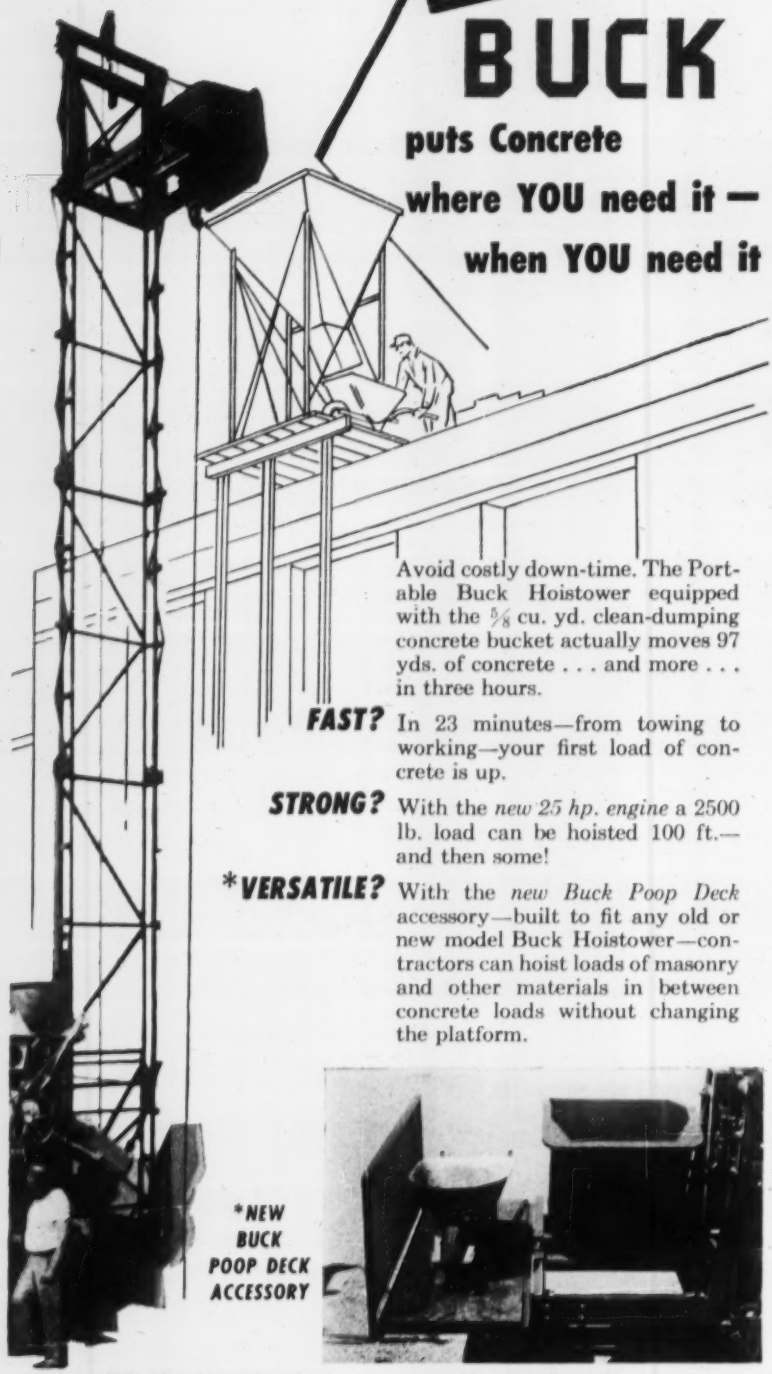
AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

BUCK

puts Concrete where YOU need it — when YOU need it



Avoid costly down-time. The Portable Buck Hoistower equipped with the ⅝ cu. yd. clean-dumping concrete bucket actually moves 97 yds. of concrete . . . and more . . . in three hours.

FAST? In 23 minutes—from towing to working—your first load of concrete is up.

STRONG? With the *new 25 hp. engine* a 2500 lb. load can be hoisted 100 ft.—and then some!

****VERSATILE?*** With the *new Buck Poop Deck* accessory—built to fit any old or new model Buck Hoistower—contractors can hoist loads of masonry and other materials in between concrete loads without changing the platform.

****NEW BUCK POOP DECK ACCESSORY***

Whether it be the platform, concrete bucket, Buck Poop Deck or Chicago Boom, depend on Buck.

For free literature—and to action test this machine—see any of the 73 Buck dealers or write direct.

BUCK EQUIPMENT CORPORATION

720-E ANDERSON FERRY ROAD, CINCINNATI 38, OHIO

In Canada: London Concrete Machinery Company London, Ontario

In England: Millars Machinery Co., Ltd. London, E.C. 2.

. . . New Products

30 Ton Roller Provides High Density Compaction

A new 30 ton self-propelled roller for asphalt, base and subgrade compaction work is on the market. In controlled tests in Ohio, the roller is reported to have produced densities averaging from 101.5% to 103% on asphalt surfaces in one or two passes. On base aggregate compaction tests, the roller obtained 95% densities in two passes.

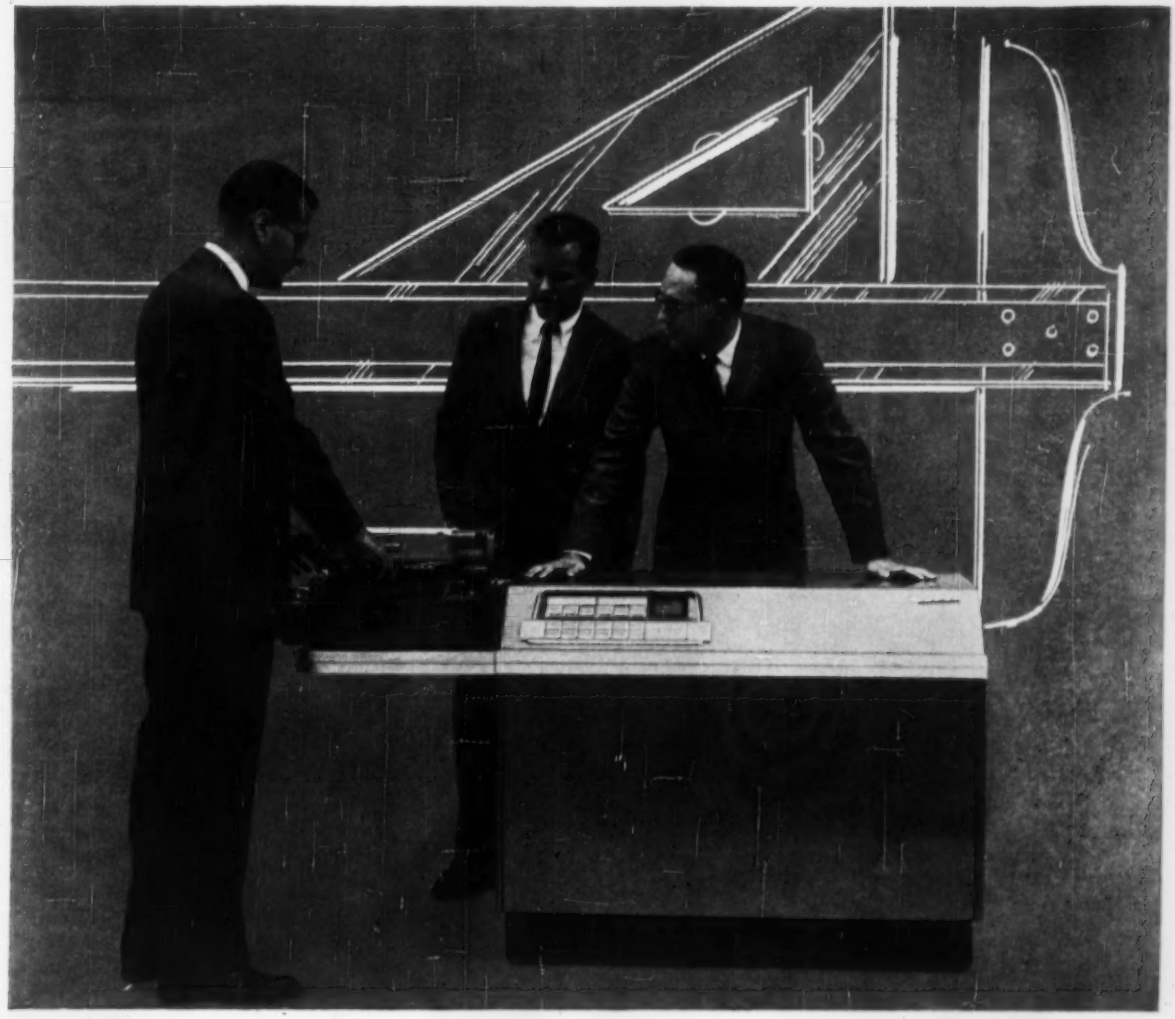
Design features include three wheels in front and four wheels in the rear, with full oscillation to provide even flow of compaction pressures. Rear wheel pairs have positive chain drive from power take-off.

A torque converter drive provides smooth, even transmission of power to the drive wheels. It is powered by a 95 hp diesel engine developing 1,800 rpm at operating speeds. Bros Incorporated, Road Machinery Div., 1057 Tenth Ave. S.E., Minneapolis 14, Minn.

Power Controls Simplified For Crawler Crane Rig

Two-lever, "Joy-Stick" power controls now are available on the Lorain-26, a crawler mounted machine with a heavy duty ¾ yd rating as a shovel and 17½ tons as a crane. The device controls swing, travel, hoist, crowd and retract, or powering load lowering and boom derricking by hydraulic power. The conventional three or more levers are reduced to two.

According to the manufacturer, when used as a crane the "26" can be equipped with the new internal gear boom hoist that provides a final planetary gear reduction drive to the drum to give greater precision by providing slower speeds and improved control of the boom. Thew Shovel Co., Lorain, Ohio.



Get greater productivity in highway design with this powerful electronic computer ROYAL PRECISION LGP-30

Large capacity... easily programmed and operated... mobile... low in cost

Here, at last, is a complete general-purpose electronic computer within the reach of every civil engineering firm. Remarkably small in size, completely mobile, LGP-30 saves time and money in the design of dams, bridges, highways . . . eliminates the tedium of routine calculation by bringing high-speed computation *right to your desk*. And at the lowest cost ever for a complete computer system!

Faster answers; unusual capacity. With speed and memory (4096 words) comparable to computers many times its size and cost, LGP-30 gives you fast, effortless answers to such problems as cut and fill, grade profile, traverse closure, field stakeout, bridge design, highway alignment. Self-cooled, LGP-30 operates from any convenient wall outlet, gives you stored-program operation for greater flexibility. (For example, highway design geometry breaks down into approximately 14 different component problems; these may all be stored in the LGP-30 and used in whatever combination is required.) Thus you save valuable time, cut costs, better your competitive position.

Easy to operate and program. LGP-30's remarkably simplified controls may be operated with only minimum computer experience. Answers are printed out directly . . . do not require deciphering. Programming is easily learned. A library of sub-routines, plus programs for a wide variety of applications, are available.

Wide range; exceptional value. The most powerful computer of its size yet developed, LGP-30 is the greatest value in today's market. Smallest initial investment ever for a complete computer . . . low operating and maintenance costs. Service available coast-to-coast.

For further information and specifications, write Royal McBee Corporation, Data Processing Equipment Division, Port Chester, N. Y.

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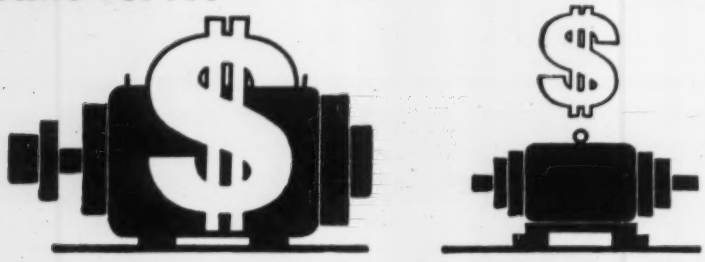
WORLD'S LARGEST MANUFACTURER OF TYPEWRITERS AND MAKER OF DATA PROCESSING EQUIPMENT

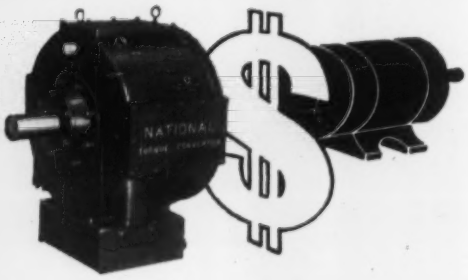
When electrically driven equipment calls for...



a special, costlier motor to start things

but only a low-cost motor to run them

Why not try this...



A National Torque Converter to give high starting torque | with your cost-saving motor to keep things moving

National Torque Converters give you "big motor" torque from small motor investment

Like a car in heavy traffic, the work-cycle of a lot of heavy, electrically-driven equipment is stop-and-go, stop-and-go.

If the motor is selected to take care of *running* requirements, it won't have the starting torque needed to pick up heavy loading fast. If the motor is selected for *starting* requirements, it is likely to cost considerably more—both to buy and to run.

The best answer is to install the more economical motor—and let it drive through a National Torque Converter. The converter will multiply the motor's torque for picking up the loads . . . ease the shocks and stresses of operation . . . bring economy in first cost and day-to-day service. National Torque Converters are available in a range of capacities from 100 to 1000 HP. For detailed technical information, just write:

THE NATIONAL SUPPLY COMPANY

INDUSTRIAL PRODUCTS DIVISION

Two Gateway Center, Pittsburgh 22, Pa.

Pace-setters in the progress of industrial power transmission

Publications

Excavators—An 8-page booklet describes the line of Rapier excavating equipment including shovels, draglines, cranes, dragshovels, skimmers, grabs, pile drivers and walking draglines. RANSOMES & RAPIER, LTD., 32 VICTORIA ST., LONDON.

Payhaulers—Cycle-speeding advantages of International Harvester's line of off-highway haulers are shown in catalog CR-603-G. It describes Payhauler advantages on each phase of the haul cycle: spotting, loading, hauling and dumping. Close-ups of components that contribute to the advantages accompany each division of the booklet. CONSTRUCTION EQUIPMENT DIV., INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Chemical feed pumps—A four-page brochure describes and lists specifications for four models of variable volume chemical feed pumps, with maximum capacities of seven quarts per hour. LIMPERT LABORATORY, INC., 121 S. CLINTON AVE., BAY SHORE, N. Y.

Road forms—Fully illustrated bulletin No. 57-165, includes complete design details, specifications and sizes of Rex road forms. CHAIN BELT CO., 4701 W. GREENFIELD AVE., MILWAUKEE 1, WIS.

Tractor-shovel—Faster, economical operation is the claim of the 1 cu yd capacity model LHM-75 Trojan tractor shovel, described in a brochure issued recently. YALE & TOWNE MFG. CO., CONTRACTORS MACHINERY DIV., BATAVIA, N. Y.

Crawler tractor—A 20 page catalog, CR-634-G, on the International TD-24 torque converter or gear drive crawler tractor describes the features of the new crawler tractor in detail. CONSUMER RELATIONS DEPT., INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Automation—Features of the new Univac Data Automation System are fully covered in manual. Included are description and illustration of all available equipment and its function; a non-technical guide to the binary number system and the seven place code of the Univac II system. A technical description of how the Central Computer is organized functionally, and an explanation of the system's entire repertoire of instructions also are included. REMINGTON RAND UNIVAC, 315 FOURTH AVE., NEW YORK 10, N. Y.

(*Publications continued on page 88*)

Kenneth Erickson, Transportation Foreman, Vanadium Corp. of America, Durango, Colorado, reports:

"We get up to 225,000 miles' service on torture roads like this...with nylon cord tires"

300 MILES A DAY. Sharp rock, sand, water holes and chuck holes give tires a rough time on this haul from Monument Valley, Arizona, to Durango, Colorado. They've got to carry the weight of 12- to 22-ton loads of uranium ore 300 miles a day in temperatures that range from 0° in winter to a blistering 110° in summer.

RESULTS WITH NYLON. "In spite of extreme weather and road conditions, these tough nylon cord tires give us as many as seven retreads. That's about seven times as many as we used to get. Mileage? We get 45-50,000 miles on original treads and an average of 25,000 miles on each recap. Our company uses from 35 to 40 vehicles on hauls like the one shown above, and we used to take heavy losses in maintenance and downtime. That was before we changed over to nylons 4½ years ago. Now we've cut down on tire costs . . . wouldn't think of buying tires without nylon cord."

PROVE TO YOURSELF that nylon cord truck tires, through retreading, give more mileage . . . the lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarn, does not produce tires.)

Du Pont nylon for tire cord

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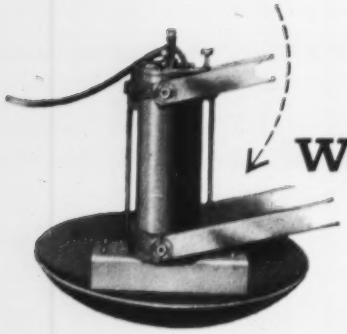
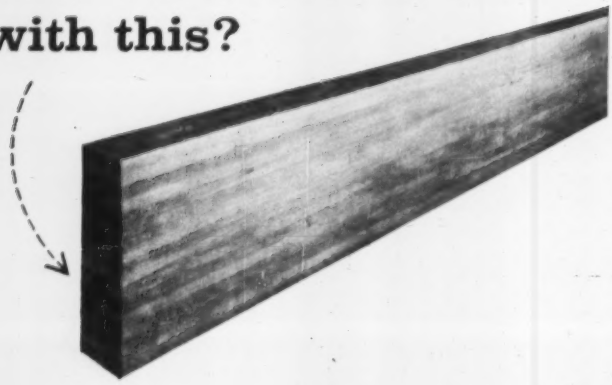
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

For trucks and passenger cars, too . . . the strongest, safest tires are made with nylon cord



What is this?

and what does it have to do with this?



To answer the questions in order, (1) The object that looks like a mushroom turned upside down is an *electronic moisture detector.* (2) It means that every laminated member by Timber Structures, Inc. is material of *uniform quality* that may be depended upon without question.

Every piece of laminating stock at Timber Structures, Inc. is electronically examined by this moisture detector. If a piece is improperly dried, the moisture detector marks it with a big red spot, and the piece is not used for laminating. Result: only properly seasoned material is used, and the glue bond between laminations is as permanent as the wood.

Such care is typical of the rigid quality control maintained at Timber Structures, Inc. over every step of manufacturing—grading materials . . . kiln drying . . . testing glues . . . surfacing laminations . . . glue application . . . clamping pressures . . . surfacing of laminated timbers . . . fabricating to full size pattern . . . protection during transit and erection.

Thus quality at Timber Structures, Inc. is an actual accomplishment made possible through continuing research and almost nagging quality control. Such safeguards, plus a record of 29 years experience, enables us to stand behind our product, knowing each timber is worthy of this continuing responsibility. No other kind of product is good enough!

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TIMBER STRUCTURES, INC. OF CALIFORNIA

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. . . Publications

Construction equipment—An 8 page bulletin, CG-15, describing and illustrating products manufactured for construction use by Le Roi, now is available. The catalog includes specifications of portable air compressors, both reciprocating and rotary; of the Tractair, a combination compressor-tractor; and of air tool attachments, including breakers, drills, tampers and spades. SALES PROMOTION DEPT., LE ROI DIV., WESTINGHOUSE AIR BRAKE CO., MILWAUKEE, WIS.

Track rollers—Case histories citing the varied conditions under which the Caterpillar "500" track rollers were field tested appear in booklet DE-744, "Weigh the Evidence". CATERPILLAR TRACTOR CO., ADVERTISING DIV., PEORIA, ILLINOIS.

Jib cranes—A catalog sheet describing base mounted jib cranes has been published. It provides all the information and specifications required for selection of crane capacity, boom length and height of lift. BECKER CRANE & CONVEYOR CO., 4900 RIDGE ROAD, CLEVELAND, OHIO.

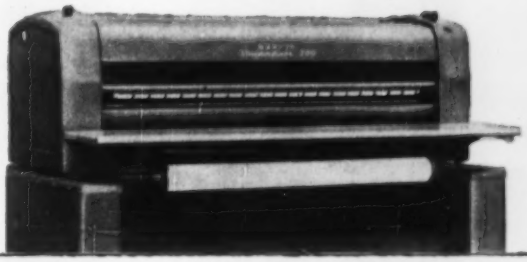
Deck screens—Five new larger size models of the Symons Rod Deck Screen are described in an eight-page bulletin. Diagrams, photographs and dimensional drawings to illustrate operating principles are included. NORDBERG MANUFACTURING CO., MILWAUKEE 1, WISCONSIN.

Towing tractors—Engineering, design and construction features, along with operating data and specifications covering recently introduced industrial towing tractors, are outlined in a bulletin BU-337A. BUDA DIV., ALLIS-CHALMERS MANUFACTURING CO., MILWAUKEE, WISCONSIN.

Angledozers—A power-angling dozer blade for 80 and 100 hp Case Terra-Trac crawler-tractors is featured in bulletin CTS-106. It shows how the operator simply moves a lever to angle the blade 21 deg to either side by hydraulic power. Charts comparing tractor power, speeds and blade action with competitive angledozers are included, along with two pages on the "counter-rotating" transmission. J. I CASE CO., RACINE, WISCONSIN.

Bituminous distributors—Complete details and mechanical specifications of the Littleford Model D Spray Leader Bituminous Distributor are available in the new bulletin HH-30. LITTLEFORD BROS., 453 E. PEARL ST., DEPT. HH-30, CINCINNATI, OHIO.

How to make design changes in minutes . . . and cut drafting costs, too



There's no more need to bog down drafting operations with time-wasting tracing or redrawing of your original design.

Now with Ozalid intermediate materials, you can make design changes quickly, neatly, easily. Ozalid intermediates give you exact duplicate originals that can save you *hours* of drafting time. Specific detail changes are as simple as 1–2–3. Just make an Ozalid intermediate print . . . on film, translucent paper, or cloth . . . and remove obsolete details with Ozalid Corrector Fluid. If you prefer, unwanted details can be removed by "scissor-editing" or the "lock-out" method. Next, draw in your new design and you've got a new, up-to-date original . . . all ready for running prints.

And with the convenience of the *table model* Ozalid Streamliner 200, you can run prints off in seconds . . . *full 42" width* prints that are yours at *low cost*. No more waiting for prints. Now *anyone* in your office can turn out sparkling whiteprints on-the-spot.

But why not see for yourself? Call your local Ozalid representative or write: Ozalid, Dept. N-12, Johnson City, N. Y.

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Extra Work Claims

Damages caused by floods are held not compensable

A federal contract clause allowing a contractor to treat as extra work repairs to damaged material supplied by the government has been held not to cover repairs to installed equipment damaged by floods.

The question arose in California, where Donovan-James Co. had a contract to construct a steel tower transmission line within the Bureau of Reclamation's Central Valley Project in California. It subcontracted part of the work to another contractor. After work had been commenced, a storm of unusual severity occurred along the entire length of the Central Valley resulting in unusually heavy rainfall in the headwater areas in all the streams having their sources in the Sierra Nevada Mountains. On three different occasions the American River overflowed its banks and caused a serious flood in the area where the contract work was in progress. The flood stream carried vast quantities of debris and caused considerable damage to the contract work. Excavations for footings were filled with silt, and the backfill around other footings was washed away. Damage was also done to part of the steel work and many pieces of steel were bent or lost.

The repair of the steel towers and of the unassembled components was made by the firm of Carrico & Gautier to whom this part of the work had been sublet by the general contractor. The cost of making these repairs amounted to $14,555.56, and the general contractor brought an action against the Government, in behalf of the subcontractor, to recover such damage. The claim was based on a contract provision to the effect that the contracting officer may order the contractor to repair material which is damaged due to no fault of the contractor and payment therefor will be made as extra work. The Government contended, and the court sustained it, that the contract provision in question applied only to damage to material that was being delivered to the job and not to materials damaged after delivery by the Government.[1]

The court stated: "The repair of the type of damage sustained here is not generally regarded as extra work, and we do not believe that a provision such as that found in the contract specifications, which provides that the contracting officer may treat the repair of certain damaged material as extra work, is subject to an interpretation which would make the Government accountable for the repair of damage which happens not to be the fault of the contractor. While the damage might have occurred while the materials were being transported or handled, the damage in question actually occurred to the steel towers and materials after delivery and not while the materials used to build the towers were in the process of being transported or handled as provided in paragraph 58 of the specifications. Therefore, the exception to the general provisions that the plaintiff must bear the cost of repair to materials furnished by the Government where the damage occurs after delivery, which exception appears in paragraph 58 of the specifications and has a limited application, does not serve to place on the Government the obligation to pay for the repair of the materials damaged under the particular facts in this case."

(1) Donovan Construction Company v. United States, 149 F. Supp. 898, U. S. Court of Claims, April 3, 1957.

Overhead Charges Denied On Contract Cancellation

A court has held that a contractor is not entitled to recover overhead charges for work not performed when a government contract, let on a cost-plus basis, has been cancelled.

The government had entered into a contract whereby the contractor was to demolish certain houses and reconstruct them in a different locality. The work was to be performed on a cost plus basis. There were 14 projects involved and the funds appropriated for the work became exhausted after nine projects were completed, whereupon the government cancelled the contract. The contractor brought an action to recover, among other things, the overhead cost for the entire project. The trial court granted the contractor a judgment, but this was reversed on appeal.[1]

The contract provided that the overhead to be allowed would depend upon the number of finished dwelling units, and also provided that the contractor would make no claim against the government for reimbursement of overhead expenses beyond those amounts specified per finished dwelling unit. The contract gave the government the right to terminate the contract at its convenience, in which event the contractor would be reimbursed for construction costs directly attributable to the performance of the contract. There was nothing in the contract providing for the payment of the full amount of the scheduled overhead upon the termination of the contract, nor was there any specific provision for adjustment of overhead charges in the event the contract was terminated. Under such circumstances the appellate court held that the contractor was not entitled to recover any overhead charges for the dwellings that were not built.

(1) United States v. Nickel, 243 F. 2d 924, U. S. Court of Appeals, Tenth Circuit, April 26, 1957.

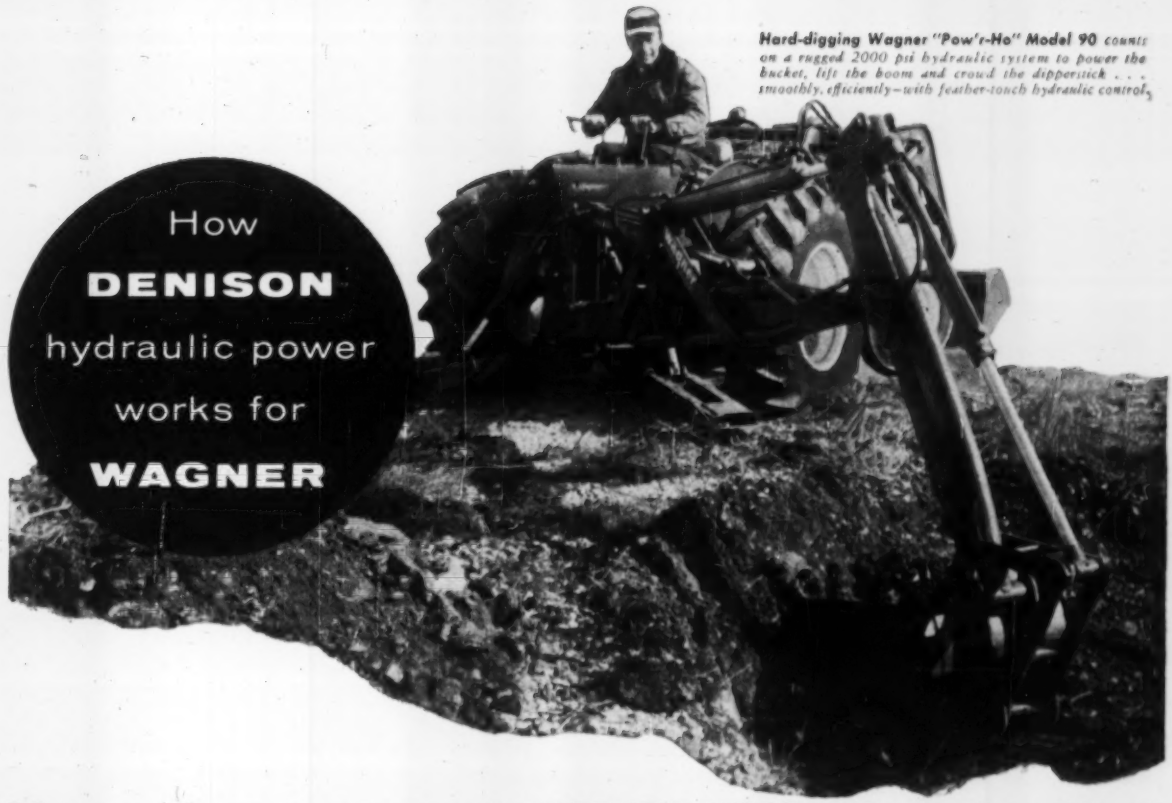
Liability to Coordinate Contracts for a Project

When large buildings such as schools and hospitals are built it is common practice to contract various parts of the work to different contractors. When this is done, it is the duty of the person for whom the work is being performed to see to it that the various contractors coordinate their parts of the work, so that each contractor shall be able to perform its part of the work in the usual economical manner and where he fails to do this, the contractor is entitled to recover for the increased cost of the work resulting from such default.

In one case,[1] the court held that the State of New York was liable to a contractor for damages sustained as a result of the default of a separate contractor who undertook contemporaneously to perform and complete a certain part of the work on the same completion date. The default compelled plaintiff contractor to rearrange its progress plan in a manner not originally contemplated and to perform various phases of its work in a different sequence and in a piecemeal manner, thereby greatly increasing the cost of the work.

The court stated: "Under such circumstances, the claimant is entitled to reimbursement for the damages sustained, as it is well established that the state is liable for the damages occasioned by the default of a separate contractor who undertakes contemporaneously to perform and complete work on the same completion date. Afgo Engineering Corp. v. State, 244 App. Div. 395, 279 N.Y. Supp. 512, affirmed 268 N.Y. 716, 198 N.E. 573; Charles Smith & Son Const. Co., Inc. v. State of New York, 266 App. Div. 886, 42 N.Y.S. 2d 814."

In the Smith case, plaintiff had a contract to install certain permanent sanitary work which could not be done until the plumbing contractor had per-



Hard-digging Wagner "Pow'r-Ho" Model 90 *counts on a rugged 2000 psi hydraulic system to power the bucket, lift the boom and crowd the dipperstick . . . smoothly, efficiently—with feather-touch hydraulic control.*

How **DENISON** hydraulic power works for **WAGNER**

How the rugged WAGNER "Pow'r-Ho" bites 12-feet deep

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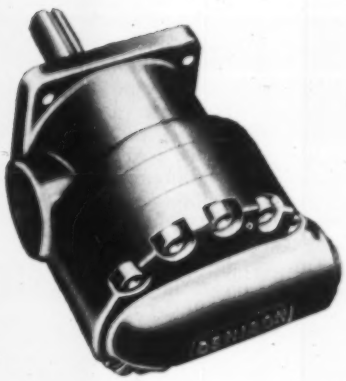

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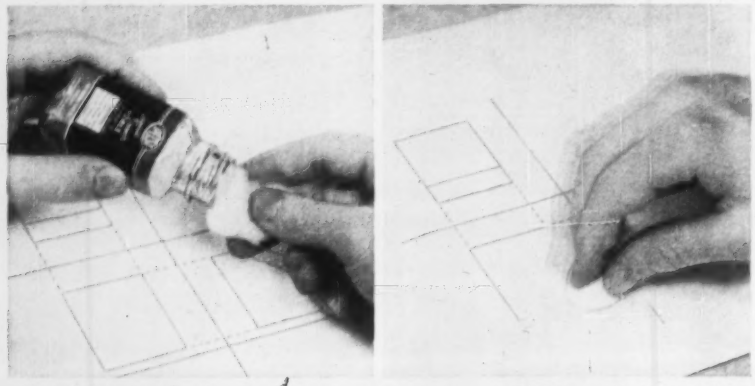

Use of Liquidator makes it easy to erase large areas on POST pencil cloths without affecting the surface.

Improve drawing board cleanliness for better prints

Poor original drawings make poor prints. No matter how good the reproduction equipment, an original that is marred by graphite smears, has become spotted through frequent handling, or has been creased too often will produce a difficult-to-read print.

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(l. to r.) POST Liquidator, POST Dry Cleaning Pad, POST Dust-It.

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Should smudges occur they should be removed immediately—preferably with a Post dry cleaning pad. The pad contains a special compound which is sifted in a sprinkling manner through the pad over the area to be cleaned. Then, by rubbing very easily with the pad, graphite smudges disappear without damaging the drawing.

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Care in removing unwanted elements is necessary to avoid marring the drawing surface of the paper or cloth. For users of Post's popular pencil cloths, an extremely simple and satisfactory method of eradicating is the use of Post Liquidator.

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formed his part of the work. The plumbing contractor failed to progress his work in a prompt and efficient manner and failed to furnish materials when needed. As a result, plaintiff contractor was delayed in the performance of the work and was compelled to rearrange his progress plan in a manner not originally contemplated, which added considerably to the cost of the work. Plaintiff contractor was allowed to recover the increased cost of the work.

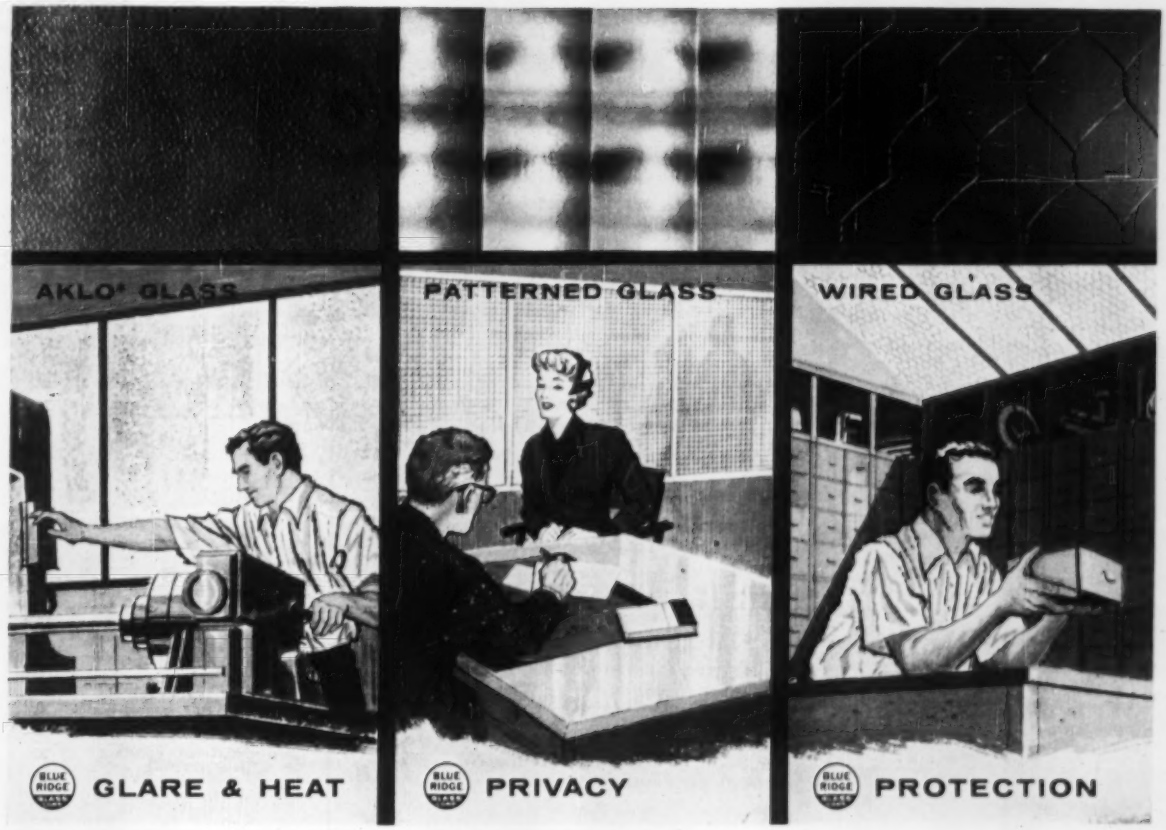
(1) Heating Maintenance Corp. v. State of New York, 47 N.Y.S. 2d 277.

A Written Acceptance May Be Essential to Contract

Where an offer is made to a municipality subject to the condition that no contract shall exist until accepted in writing and the offer is accepted by the municipality but not transmitted in writing and thereafter the acceptance is revoked and the contract awarded to some one else, the party who submitted the first offer has no cause of action for breach of contract, since the offer was not accepted in writing.[1]

An Illinois court, which reached that conclusion, stated: "In Baltimore & Ohio S. W. R. Co. v. People ex rel Allen, 195 Ill. 423, 63 N.E. 262, 263, it appeared that a board of education accepted a bid of a contractor to construct a school building, it being understood that a formal building contract acceptable to the board of education was to be thereafter signed. The Supreme Court held that at the date the bid was accepted there was no contract in existence and would not be until the written contract was executed. In the course of its opinion the court quoted from 7 Am. and Eng. Ency. of Law, 2d Ed., p. 140, where it is said: 'Where the parties make the reduction of the agreement to writing, and its signature by them, a condition precedent to its completion, it will not be a contract until that is done. And this is true although all the terms of the contract have been agreed upon. But, where the parties have assented to all the terms of the contract, the mere reference to a future contract in writing will not negative the existence of a present contract.'

"In 38 Am. Jur. 176, Municipal Corporations, Sec. 501, it is said: 'While the contracts of a municipal corporation are ordinarily executed and signed by the mayor or the chief executive officer on behalf of the corporation, it is possible for a contract binding a municipal corporation to be brought into existence by a vote of the municipal council. Thus an ordinance or resolution which is in



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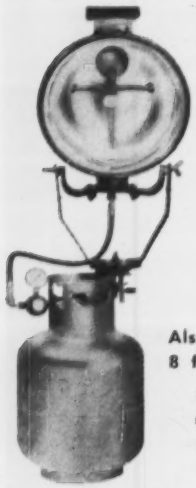

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effect an offer by a municipal corporation, upon acceptance by the party to whom it was addressed, becomes a contract, similarly, when an offer has been made to a municipal corporation, a vote of the municipal council accepting the offer will constitute a contract. In such a case, the minutes and record of the proceedings of the municipal council constitute sufficient compliance with the statute of frauds. Care should be taken, however, to distinguish between the vote of a municipal council consisting in and of itself an offer or acceptance and a vote authorizing the executive officers to enter into a contract. In the latter case, the municipality will not be bound until the executive officers have acted.'"

(1) **Brophy v. City of Joliet, 144 N.E. 2d816, Appellate Court of Illinois, Sept. 4, 1957.**

Suit Based on Fraud

Statute of limitations runs from discovery

A cause of action based on fraud arises when the fraud is discovered. The statute of limitations runs from the point of discovery, not from the date of the contract.

The rule was recently followed in New York, where a contractor sued the state for the increased cost of work resulting from a change made in grade of spoil banks along a river channel. After the contractor had started the job, the State Engineer changed the height of the banks and the contractor later discovered that before the contract was awarded, the State had determined to reduce the height of the banks. This was not disclosed to the contractor at the time it submitted its bid. The contractor contended that the concealment of such material information constituted fraud and entitled it to the increased cost of the work.

In New York, the statute of limitations in an action based on fraud is six months. The State made an application to the court to have the action dismissed on the ground that more than six months had elapsed since the cause of action accrued. It appeared that the action was commenced shortly after the fraud was discovered and within the six month period provided by statute. "An action in fraud arises when the fraud is discovered. Only then does the statute of limitation begin to toll. Nasaba Corp. v. Harfred Realty Co., 287 N.Y. 290, 39 N.E. 2d 243."

The court stated: "A contract, when prepared by the party who is charged with fundamental knowledge of all its details, should embody all the elements required for its performance, the good and the bad, so that in reliance upon them all a proper bid may be submitted. The State should set such example. Atlanta Construction Co. v. State of New York, 103 Misc, 233, 175 N.Y.S. 453."

"The case of Jackson v. State, 210 App. Div. 115, 205 N.Y.S. 658," the court continued, "is akin to this one. There, plans upon which a contract was made for excavating in the construction of a section of the Barge Canal provided for excavation of sand and gravel or loose material, whereas in fact the material excavated was hardpan requiring different tools and more expense to excavate. It was proven that the state knew it was hard-packed material, but its contract and plans did not disclose that fact. The Appellate Division stated at page 119 of 210 App. Div., at page 661 of 205 N.Y.S., 'it was more than a failure to state all the facts in the state's possession. It was a representation of a fact entirely contrary to the actual fact known by the state when the representation was made.'"

The court held that the question of whether or not the contractor was induced to enter into the contract in reliance upon fraudulent misrepresentation or fraud on the part of the state in concealing material information was a question to be determined at the trial.

(1) **A. S. Wickstrom, Inc. v. The State of New York, 162 N.Y.S. 2d 292, Court of Claims of State of New York, May 1, 1957.**

Court Refuses To Disturb An Arbitrator's Decision

If a dispute between an owner and a contractor is submitted to arbitration, the parties generally have little redress from the decision.

The finality of an arbitration award is discussed in the following District of Columbia case.

During the course of the construction of a housing project, many disputes arose between the contractor and the owner. The principal dispute was in reference to an adjustment of the contract price due to additions and deletions in the work called for by the original plans and specifications. The owner also claimed that there were many defects in the work that the contractor refused to correct. The owner brought an action for a judgment decreeing that it owed the contractor nothing. The contractor counterclaimed for a balance he claimed was due him under the contract.

After the suit was started, the par-

ties agreed to submit the matter to an arbitrator and have him determine if there was anything owing the contractor. The arbitrator made an award in favor of the contractor in the amount of $1,498,685.04. The owner applied to the court to have the award set aside which application was denied.[1] The court held that it was not improper for the arbitrator to substitute his opinion as to the value of certain items of work for that produced at the hearing, notwithstanding the fact that both of the parties had agreed to the value of these items.

In the instant case, the arbitrator was an expert in construction work, and under the arbitration agreement he could decide the matters under dispute on his own experience even though his conclusions were in conflict with the testimony. The mere fact that a court's viewpoint upon the valuation of certain items of work involved in the controversy varied from that of the arbitrator was not a basis for setting it aside. The parties are bound by the determination of the arbitrator, in the absence of a clear showing of bias or prejudice which was absent in this case.

(1) Arlington Towers Land Corp. v. John McShain, 150 F. Supp. 904, U.S. District Court, District of Columbia, Feb. 26, 1957.

No Extra Work Recovery In Absence of Agreement

A subcontractor cannot recover from a prime contractor for extra work in the absence of any agreement to pay for such extra work.

In a case that arose in the federal courts, the U. S. Government contracted for construction of certain additions to the water supply system at the Red River Arsenal in Bowie County, Texas. The contractor subcontracted part of the work.

The subcontractor brought an action under the Miller Act to recover as extra work the increased cost of making the excavation work resulting from encountering tree stumps and for other items. At no time did the parties agree on the payment for such work as extras. The trial court held that in the absence of any agreement on the part of the prime contractor to pay for such work as extras, the subcontractor was not entitled to any recovery. This judgment was affirmed on appeal.[1]

The appellate court pointed out that the prime contract contained provisions for the settlement of disputes, and that while the subcontractor had no claim against the prime contractor, the subcontractor could under the equitable principles of subrogation require the prime contractor to prosecute the claims under his prime contract with the government, in which event the dispute of the claims would be settled in the manner provided for in the prime contract.

(1) United States v. George, 243 F. 2d 83, U. S. Court of Appeals, Fifth Circuit, March 29, 1957.

A Right To Rescind Is Waived by Delay

If a party to a contract discovers grounds for repudiation, such as fraud, he must act immediately.

In an Ohio case, for example, a seller of a heating supply business sued for the unpaid balance of the purchase price. In a counterclaim, the buyer asked rescission of the contract on the ground that he bought the business in reliance on the false representations of the seller as to having franchise rights to sell certain products in the area where the business was located.

The contract was entered into in August and the buyer immediately took possession of the business. The buyer learned at once that the representations were false but made no complaint about it and continued to operate the business through the month of September, when he inserted an advertisement in a local paper offering the business for sale. The buyer did not express any intention of repudiating the contract until late in September, when the seller demanded payment of the balance due under the contract of sale.

The court held[1] that, under the circumstances of the case, the buyer had waived his right to rescind the contract. The court stated: "A waiver is generally defined as an intentional relinquishment of a known right, or such conduct as warrants an inference of relinquishment of such right." The court held that in view of the fact that the purchaser continued to operate the business for a month after he learned of the fraudulent representations, such conduct must be construed as a waiver of the right to rescind the contract. "Duty rested on the defendant (buyer) to act promptly upon discovery of the fraud. He cannot remain silent, continue to experiment with the business, and a month later assert his right to declare the contract void."

(1) Meyers v. Hoops, 140 N.E. 2d 65, Court of Appeals of Ohio, Dec. 14, 1955.

These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.

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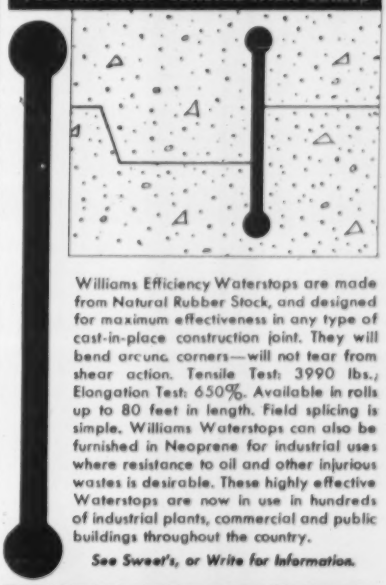

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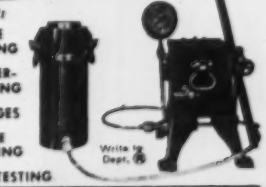

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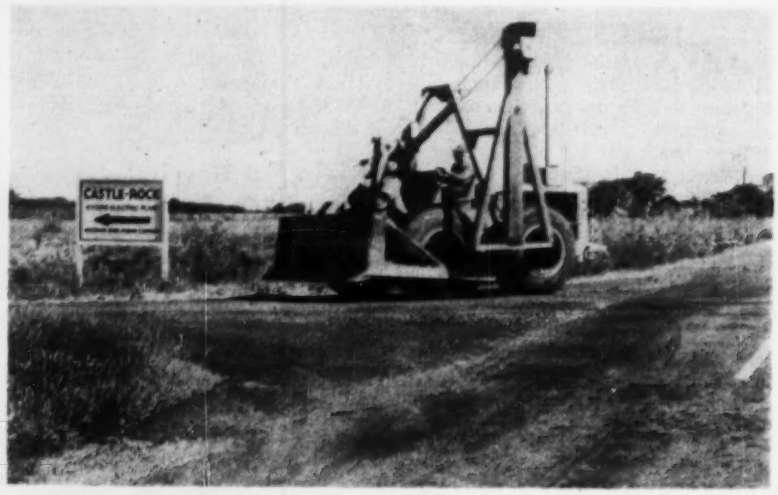
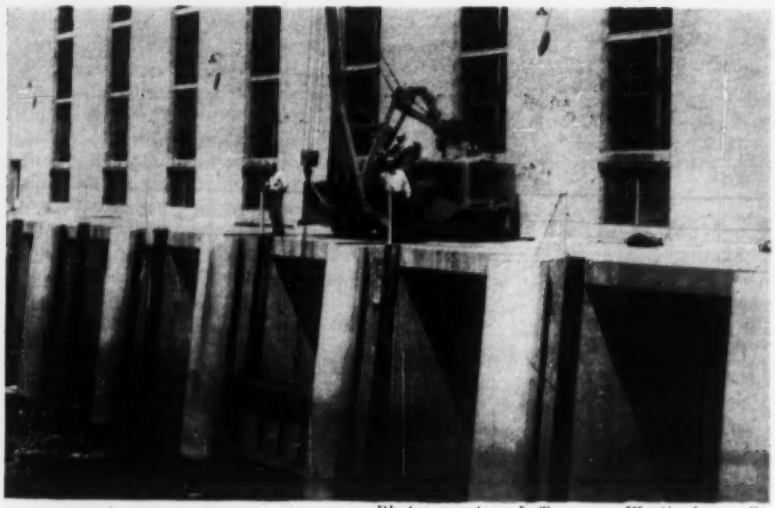


Scooting 19 miles from one dam to another . . .



Photos courtesy LeTourneau-Westinghouse Co.

Crane-equipped tractor is used to raise and lower tail gates

Double-Duty Dozer Handles Dam Gates

The Wisconsin River Power Co. has a rubber-tired tractor equipped with a side-boom crane that is proving a versatile workhorse. Most of the time, it does dozing work connected with plant operation and land improvement. But when it's time for periodic inspection or servicing of the Smith-Kaplan turbine propellers at two of the company's power dams, it scoots off to install tail water gates to enable dewatering of the propeller chambers.

The two dams are 19 miles apart and the tractor travels over the highway under its own power, making the trip in less than an hour. The permanently attached side-boom crane is used to raise or lower the gates as well as move them from place to place. Since inspection at the two dams—Petenwell and Castle Rock—is an infrequent process, using this highly mobile gate lifter sidesteps a double investment in identical equipment at both dams.

Other jobs that the tractor does include building several public parks along the lake shores which are almost wholly owned by the company.

Placing 9" thick concrete second floor for this low-cost, fireproof, Wisconsin dairy warehouse.

Bottom photo.: Concrete block walls for this 140' x 90' building were laid up with Lehigh Mortar Cement.

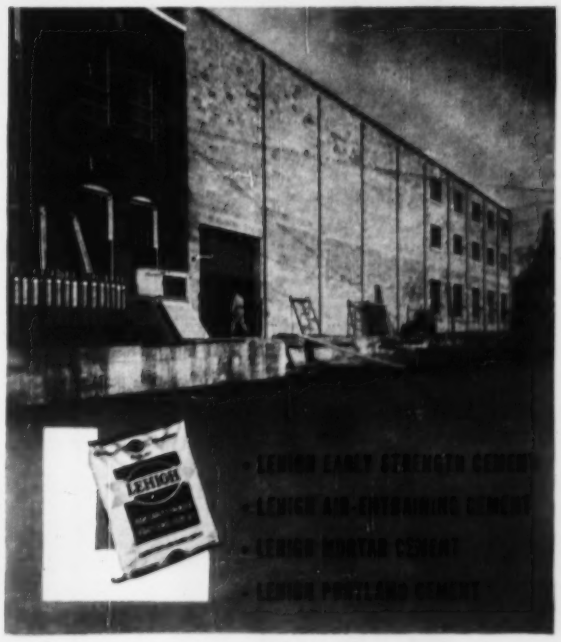
Owner: Sanna Dairies Inc., Menomonie, Wisconsin
Contractor: Stahr Company Inc., Minneapolis, Minnesota

LEHIGH EARLY STRENGTH CEMENT cuts **mid-winter** construction costs

This new warehouse was being built in Menomonie, Wisconsin just a year ago. Temperatures dropped to 15° below zero. To keep mid-winter construction costs down and have the job ready for the owner by early spring, Stahr Company Inc. used Lehigh Early Strength Cement.

The quick-curing concrete made with Lehigh Early Strength Cement enabled the contractor to cut form rental costs 30% and to reduce winter protection costs 50%. What's more, with less bleeding and earlier hardening of the early strength concrete, finishers' overtime was cut 50%.

Remember Lehigh Early Strength Cement when planning winter concrete work. On large jobs and small, chances are it will save *you* time and money.



LEHIGH PORTLAND CEMENT COMPANY
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James Anderson Retires As Highway Commissioner

James A. Anderson, teacher and highway administrator, has retired as commissioner of the Virginia Department of Highways, after 16 years in that post.

Deputy Commissioner and Chief Engineer Frances A. Davis has been named acting commissioner. A permanent commissioner will be appointed by Governor-Elect Lindsay Almond, who takes office January 11.

Mr. Anderson, 1951 president of the American Society of State Highway Officials, was born in Linden, Va., in 1892. He was graduated with honors from Virginia Military Institute in 1913 with a B.S. degree in civil engineering, and in 1917 he received a C.E. degree from Cornell University.

Prior to entering the Army in 1917 as a captain in the Quartermaster Corps, Mr. Anderson taught civil engineering at V.M.I. While in service he went to France with the 30th division, later served on the general staff of the first army and the Army of Occupation. He left active service in 1919 with the rank of lieutenant colonel to handle construction operations for the Baltimore and Ohio Railroad. In 1920 Mr. Anderson returned to V.M.I. as associate professor and later professor of civil engineering. He was given leave of absence from the school in 1933 to assume the position of Virginia director of the Public Works Administration.

In 1937 Mr. Anderson returned to V.M.I. as dean of the faculty, a post which carries with it the rank of general in the Virginia State Guard. He left V.M.I. again when the late Gov. James Price appointed him Commissioner of Highways in 1941.

First Raymond Pile Co. Scholarship is Awarded

The first Raymond Concrete Pile Company Fellowship in Memorial to A. E. Cummings has been awarded by the University of Illinois to Harry M. Horn of Brooklyn, N. Y.

The fellowship is for graduate study in soil mechanics and was designed to encourage talented young engineers to specialize in soil mechanics. It was established by Raymond in memory of A. E. Cummings, who was a director of the company and the head of research. Mr. Cummings, who died in July 1955, was a pioneer in the field, having published over 30 articles on the subject.

Mr. Horn received a B. C. E. degree from Brooklyn Polytechnic Institute in 1953 and a masters from Columbia University in 1956.

Engineer Named to Fill Top N. Y. Thruway Post

Ending a year of uncertainty, New York's Gov. Averell Harriman last week appointed Clinton B. F. Brill as chairman of the New York State Thruway Authority. The post had been vacant since the resignation, almost exactly a year ago, of Bertram D. Tallamy, who left it to become the nation's first Federal Highway Administrator.

In the interim, David J. Martin, whose background extended from hotel building to hotel management, was acting chairman. Mr. Martin died suddenly Nov. 30.

Announcing the appointment, the Governor said also that Mr. Brill will serve as "assistant to the Governor" in connection with the state's construction program, including buildings for state institutions. In this capacity, the new appointee will work closely with John N. Johnson, state superintendent of Public Works, but the Governor's office hastened to add that there will be no loss of authority for Mr. Johnson.

A native of Mt. Union, Pa., and a graduate of Pennsylvania State Teachers' College and Massachusetts Institute of Technology, Mr. Brill was a partner in the New York consulting firm of DeLeuw & Brill. He had worked as an architect and engineer since 1926, and wound up military service in World War II as a Colonel in the Corps of Engineers. Returning to civilian life after the war, he was a partner in the firm of Downer, Green & Carillo, and served for two years as Director of Technical Services for the International Basic Economy Corp. (IBEC), before becoming associated with the DeLeuw firm.

Careers

Public Works

George Bean will become city manager of San Diego Dec. 1. In 1936 he was city manager of Escanaba, Mich., and has served in the same capacity at Pontiac, Grand Rapids and Peoria. A past president of the International City Managers Association, he was, from 1950 to 1953, one of four members of the Atomic Energy Commission's community operations panel.

Dean Allen S. Janssen, University of Idaho, is the new president of the National Council of State Boards of Engineering Examiners. NCSBEE is now composed of 53 boards of registration for professional engineers and land surveyors, consisting of 310 official members.

Associations

Richard A. Lill has been appointed highway engineer of the American Trucking Association in Washington, D. C. He has been an ATA research engineer since 1952 and succeeds **H. A. Mike Flanakin**, who resigned to join Charles M. Upham Associates, consulting engineers. Mr. Flanakin will leave for Bangkok, where the firm has been retained by the Thailand government to advise in development of a more complete highway department.

W. F. Stokes, city utilities superintendent at Hendersonville, N. C., has been elected chairman of the North Carolina Section of the American Water Works Association and the North Carolina Sewage and Industrial Wastes Association.

Jerry Swanson, chairman of the Fort Wayne Board of Public Works, has been elected president of the newly organized Indiana chapter of the American Public Works Association.

The American Society of Civil Engineers has announced appointment of a director of public relations. He is **M. O. Chenoweth,** formerly with Selvage & Lee, industrial public relations counsel.

Public Works

Orville H. Hart, assistant chief of the construction-operations department, Sacramento District, Corps of Engineers, has been named chief, replacing **Horace A. Johnson,** who has gone to a supervisory position in the Mediterranean Division.

M. B. Smith, concrete engineer for the Corps of Engineers on the St. Lawrence Seaway project, has gone to the Office, Chief of Engineers, Washington, D. C., as assistant chief of the concrete branch.

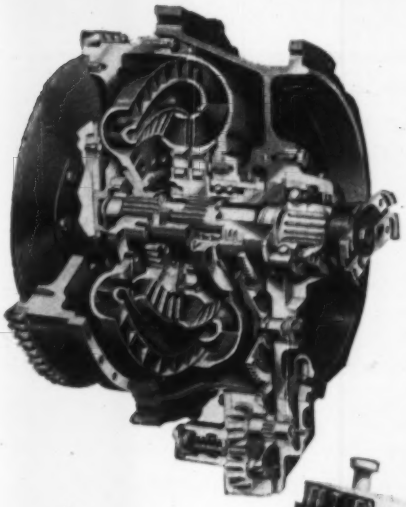
D. C. Morin has resigned as head of the consolidated city engineering departments at Fort Wayne, Ind.

Phil M. Miles has been named deputy commissioner of highways in Kentucky. He was formerly head of the maps and minerals division of Kentucky's Economic Development Dept.

Business

William T. Ingram and **Bernard Newman** have formed Newing Laboratories, Inc., in Islip, N. Y., to serve the sanitary engineering field.

NOW...choose the transmission you want on the "BIG B"



New power drive available on B Tournapull includes single-stage, 4-element converter, consisting of pump, turbine, 1st and 2nd stators; plus hydraulic retarder, for continuous downhill braking in any forward gear. Gear section provides wide selection of 4 forward speeds to 30 mph, 2 reverse to 5.8 mph.

Standard on all "B's" — whether you choose Torqmatic or step-gear transmissions — is the money-making Fullpak scraper. Because Fullpak is lower, wider, dirt flow is nearly horizontal. Result — 'Pull needs less force for *lifting* dirt, can apply more to *cutting*. Curved-top tailgate rolls dirt into corners and apron, for better "boiling". Fast-acting electric controls regulate bowl hoist, apron lift, tailgate movement, and steer, for still more speed. That's why Fullpaks get bigger, lower-cost pay loads faster . . . at lowest-net-cost-per-yard!

Fastest-loading BIG scraper now available with torque converter

The world's top-production earth-mover, the LeTourneau-Westinghouse B Tournapull® with 27-yd. Fullpak* scraper, is now available *with your choice of transmissions.* Effective immediately, you can choose the unit best suited to your production demands, fleet set-up, or service facilities. Choose between, a) new power-shift transmission, with production-boosting torque converter, or, b) hand-shift, step-gear transmission in constant mesh.

Complete power package . . . with 335 hp

New on the "Big B" is the well-known, world-tested Allison Torqmatic Drive . . . a complete power-transmitting "package" of torque converter, hydraulic retarder, range gearing, transfer gears, and accessory components. And, powering the new torque-converter "B", is a giant 335 horsepower Cummins engine.

For contractors who prefer its lower initial cost, the step-gear type Fuller transmission — with 10 forward speeds, and two reverse — is still available. With this transmission, you have your choice of a 300 hp Cummins engine or a GM unit.

Maximum power use . . . faster cycles

Main advantage of Torqmatic Drive on the B Tournapull is higher production-power. Because the torque converter *automatically* adjusts speed and torque to the load, your 'Pull keeps working at the fastest speed possible. Power flow is *never* interrupted while shifting.

Operators work more efficiently, too. There's no double-clutching, or lever-wrestling to worry about . . . no "penalty" for guessing wrong on gear range selection. Your men can concentrate on bigger loads, safer hauls, more accurate spreads.

Lowers maintenance costs

Torque-converter "B" gives you lower maintenance costs. Its new power system cushions the drive and engine from shock loads . . . prevents any damaging clash of gears . . . reduces engine wear by assuring constant, even power. Tires last longer, because the smoother starts and acceleration of a torque-converter machine cut down tire spin. And you have no old-fashioned clutch mechanism to service.

Protects your investment

B Tournapull's new, fast, easy shift improves safety . . . gives your operator full control of his machine at all times. And you'll never stall at a crucial moment . . . it's impossible to stall the new power-shift "B". Hydraulic retarder assures safer downhill hauling . . . using the fluid drive oil to dissipate energy, thus slowing the engine without wearing out your regular service brakes.

See the new "B's" in action. Figure your next job with them in mind. Ask us to give you full data.

*Trademark BP-1622-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

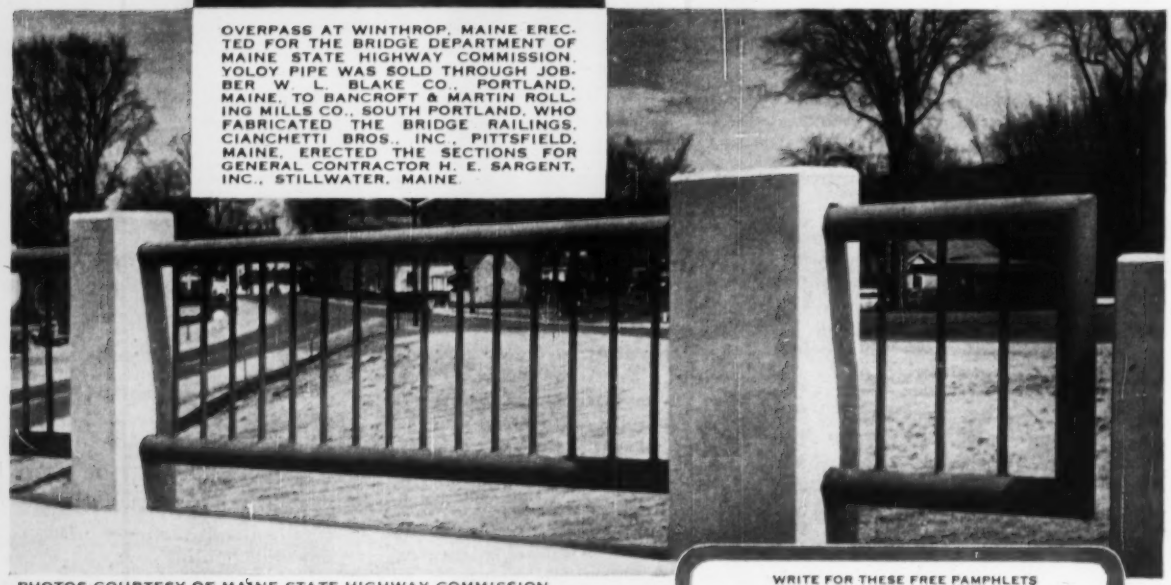
This beautiful, new overpass erected at Winthrop, Maine has sidewalk railings made of Continuous Weld Yoloy Steel Pipe. Yoloy's extra strength and excellent corrosion-resistance are qualities required for applications of this type.

"Yoloy" pipe is on the job

. . . providing strong, corrosion-resistant bridge railings for Maine State Highway Commission

Maine chose Yoloy! It proved so easy to fabricate and weld that 2 additional Maine bridges will have Yoloy railings. This nickel-copper alloy steel also demonstrates added strength and longer life making it an ideal structural pipe!

Available in Sheets, Plates, Bars, Shapes, Cold Drawn Bars and Tubular Products, Youngstown's complete family of Yoloy steels provides the right grade for each of your specific jobs. Complete informative Data Sheets on each Yoloy steel will be sent you promptly upon request.



OVERPASS AT WINTHROP, MAINE ERECTED FOR THE BRIDGE DEPARTMENT OF MAINE STATE HIGHWAY COMMISSION. YOLOY PIPE WAS SOLD THROUGH JOBBER W. L. BLAKE CO., PORTLAND, MAINE, TO BANCROFT & MARTIN ROLLING MILLS CO., SOUTH PORTLAND, WHO FABRICATED THE BRIDGE RAILINGS. CIANCHETTI BROS., INC., PITTSFIELD, MAINE, ERECTED THE SECTIONS FOR GENERAL CONTRACTOR H. E. SARGENT, INC., STILLWATER, MAINE.

PHOTOS COURTESY OF MAINE STATE HIGHWAY COMMISSION

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

QUALITY YOUNGSTOWN SERVICE

WRITE FOR THESE FREE PAMPHLETS IN THE YOLOY FAMILY SERIES:

YOLOY "E"	HIGH STRENGTH-LOW ALLOY STEEL-STANDARD APPLICATIONS
YOLOY	HIGH STRENGTH STEEL-SPECIAL APPLICATIONS
YOLOY "S"	HIGHER STRENGTH STEEL FOR INCREASED SERVICE LIFE
YOLOY "C"	CORROSION RESISTANT GRADE FOR DEEP FORMING
YOLOY PIPE	CONTINUOUS WELD FOR CORROSION RESISTANT APPLICATIONS

Power Tunnel Bid Four Ways

Two-heading, no-lining alternate is low for Cherry Power Tunnel in California's Hetch Hetchy system

The Public Utilities Commission for the City and County of San Francisco, took bids four ways for the Cherry Power Tunnel in its Hetch Hetchy water supply system. Guy F. Atkinson, The Arundel Corp. and L. E. Dixon, So. San Francisco, bidding only on the two-heading, no-lining alternate, took the job for $8,136,420. This is 7.7% below engineer's estimate and 31.5% below the high of six bids.

End to end excavation won hands down over the four-heading alternate which called for a central adit. Six contractors bid on a two-heading basis, only three on the four-heading method.

Only one joint venture bid all four ways, lining and no lining, under each method. All bids shown are after a $25,000 deduction for use of city's camp and equipment.

This is how comparable quantities and prices ran for the four alternates:

	Excavate from End to End		Excavate from Both Ends & Central Adit	
Contractor	A No Lining	B Lined	C No Lining	D Lined
A1 (contract)	$8,136,420	nb	nb	nb
A2, B1, C1, D1	8,895,555	$9,052,375	$8,991,663	$9,139,807
A3, B2	9,552,282	9,712,108	nb	nb
A4	10,510,970	nb	nb	nb
A5, B3	10,700,000	10,970,600	nb	nb
C2, D2	nb	nb	10,894,645	11,398,270
A6, B4	11,865,990	12,244,690	nb	nb
C3, D3	nb	nb	13,225,690	13,353,850
EE	8,814,655	8,819,155	8,849,925	8,952,225

A1 — Guy F. Atkinson Co., The Arundel Corp & L. E. Dixon Co., So. San Francisco, Calif.
A2, B1, C1, D1 — Kaiser-Morrison-Macco-Shea, Oakland, Calif.
A3, B2 — Walsh Construction Co., San Francisco, Calif.
A4 — Cherry Tunnel Constructors, San Mateo, Calif.
A5, B3 — Coker Construction Co. & Peter Kiewit Sons' Co., Omaha, Nebr.
A6, B4 — S. A. Healy Co., Chicago, Ill. and Brown & Root, Inc., Houston, Tex.
C2, D2 — M&K Corp., T. E. Connolly, Inc., Piombo Const Co., & Floyd Shafner, San Francisco, Calif.
C3, D3 — R. B. Potashnick & G. L. Tarlton Contracting Co., St. Louis, Mo.

This is a 12 ft x 12½ ft horseshoe tunnel 29,300 ft long, with a diversion tunnel 8½ ft dia, 5,850 ft long, mainly in granitic rock.

The tunnels are 50 miles from a railroad. The contractor furnishes all materials. Class A concrete is specified to test at 3000 psi at 28 days.

Typical wages in the San Francisco area, including fringe benefits: tractor operators $3.42; power crane and shovel operators $3.75; carpenters $3.475; truck drivers $2.65-$2.79; common labor $2.515.

The Public Utilities Commission Engineers consider these bids the most favorable—a halt in the trend toward rising prices.

Bids: 10-3-57 Items	Unit	Quantity	Unit Prices A1C	A2	B1	B2	C1	C2	D1	D2
Exc open cut (2-h job)	cy	60,000	$5.50	$3.32	$3.32	$6.10	$	$	$	$
(4-h job)	cy	86,000					3.32	3.00	3.32	3.00
tunn section	lf	3,950	188.00	245.00	245.00	222.00	245.00	215.00	245.00	215.00
	lf	24,800	158.10	193.83			182.31	238.00		
	lf	25,200			194.00	186.29			182.31	238.00
rock trap section	lf	500	300.00	327.00			327.00	360.00		
	lf	100			327.00	450.00			327.00	360.00
tunnel drain section	lf	65	300.00	270.00	270.00	355.00	270.00	250.00	270.00	250.00
surge shaft lateral	lf	40	225.00	353.00	353.00	320.00	353.00	250.00	353.00	250.00
tank shaft	lf	365	350.00	338.00	338.00	254.00	338.00	400.00	338.00	400.00
adit sta 4+72 ± (2-b job)	lf	330	300.00	411.00	411.00	322.00	411.00	500.00	411.00	500.00
257+18 ± (4-h job)	lf	700					411.00	350.00	411.00	350.00
tunnel section	lf	5,850	155.00	137.00	137.00	195.00	137.00	245.00	137.00	245.00
Feeler holes, drill	lf	100	10.00	4.40	4.40	4.50	4.40	10.00	4.40	10.00
Grtg ahead of tunnel exc	cf	100	70.00	10.00	10.00	19.00	10.00	20.00	10.00	20.00
Stl supp, instal & maintain	lb	50,000	0.40	0.40	0.40	0.45	0.40	0.35	0.40	0.35
Timber supp, erect & maintain	Mfbm	100	380.00	519.00	519.00	500.00	519.00	400.00	519.00	400.00
Excess water, handle	Mgal	10	500.00	356.50	331.90	600.00	334.90	1,250	334.90	1,250
Conc for adit sta 4+72 ±	cy	25	105.00	51.00	51.00	116.00	51.00	50.00	51.00	50.00
plug for adit sta 257+18 ±	cy	200					40.00	70.00	40.00	70.00
surge tank	cy	550	122.50	147.00	147.00	132.00	147.00	150.00	147.00	150.00
tunnel outlet portal	cy	5	155.00	160.00	160.00	105.00	160.00	200.00	160.00	200.00
pedes & Bhd in rock trap	cy	25	180.00	176.00			176.00	135.00		
struc in el—Cherry tunn	cy	150	150.00	93.00	93.00	200.00	93.00	120.00	93.00	120.00
lining forms, tunn sect	ls	job	22,000	16,000	16,000	40,000	16,000	30,000	16,000	30,000
	ls	job	6,250	13,600	13,600	40,200	13,600	20,000	13,600	20,000
lining tunn sect	lf	740	290.00	132.00	132.00	171.00	132.00	110.00	132.00	110.00
	lf	1,150	140.00	158.94	158.94	133.00	158.94	110.00	158.94	110.00
backfill—tunn sect	lf	2,800	130.00	100.00	100.00	134.00	100.00	130.00	100.00	130.00
	lf	100	98.00	51.00	51.00	89.00	51.00	110.00	51.00	110.00
drain sect	lf	65	170.00	133.00	133.00	250.00	133.00	120.00	133.00	120.00
lining surge shaft	lf	365	115.00	259.00	259.00	177.00	259.00	150.00	259.00	150.00
power tunn invert	lf	24,500			8.94	11.40			8.94	23.00
tunn sect	lf	200	210.00	146.00	146.00	330.00	146.00	230.00	146.00	230.00
Stl reinf in tunn sect	lb	500,000	0.17	0.18	0.18	0.20	0.18	0.18	0.18	0.18
surge shaft	lb	99,000	0.17	0.18	0.18	0.20	0.18	0.18	0.18	0.18
struc for el-tunn	lb	120,000	0.16	0.18	0.18	0.20	0.18	0.18	0.18	0.18
Welded wire fabric	sf	6,500	0.24	0.14	0.14	0.35	0.14	0.20	0.14	0.20
Stl liner, embedded	lb	1,720,000	0.33½	0.27	0.27	0.39	0.27	0.28	0.27	0.28
Grt holes, drill	lf	2,500	5.00	3.80	3.80	2.00	3.80	2.00	3.80	3.00
Grt & vent pipes	lf	1,000	3.50	1.44	1.44	1.90	1.44	3.00	1.44	3.00
connection	ea	3,000	7.00	8.80	8.80	15.80	8.80	14.00	8.80	14.00
pressure	cf	3,000	4.00	7.40	7.40	9.00	7.40	8.00	7.40	8.00
Roof bolts, temp	lf	2,500	3.00	2.35	2.35	2.90	2.35	1.00	2.35	1.00
permanent	lf	2,500	3.00	2.35	2.35	3.00	2.35	2.00	2.35	2.00
Gunite	cf	500	12.00	8.40	8.40	7.50	8.40	4.00	8.40	4.00
Metal, misc	lb	28,000	0.65	0.77			0.77	0.70		
	lb	18,000			0.77	0.60			0.77	0.70
Galv	lb	20,000	0.08	0.13			0.13	0.10		
	lb	13,000			0.13	0.07			0.13	0.10
Sluice gate—Cherry tunn	ls	job	12,500	16,700	16,700	13,000	16,700	12,500	16,700	12,500
Valves, air—Cherry tunn	ls	job	10,000	8,300	8,300	8,900	8,300	7,500	8,300	7,500
Pole line, 22KV	ls	job	10,000	15,900	15,900	22,000	15,900	50,000	15,900	50,000
Road maint	ls	job	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000

Completion: 930 calendar days. Liquidated damages: $200/cal days.

Furnaces and Boilers for Incinerator Bldg., Mass.

At an approximate average cost of $2,993.10 per ton/day of waste incinerated, John Bowen Co., Inc., Dorchester, Mass. will construct the 900 ton South Bay Incinerator Building for Roxbury, Mass. His bid of $2,693,793 was 3.6% above the estimate of the engineers, Metcalf & Eddy, Boston, but 11.6% below the high of ten bids.

The building, 240 ft wide, 198 ft deep with a maximum height of 73 ft, will have three 175 ft stacks and house six refuse furnaces, three 75,000 lb per hr waste heat steam boilers.

This contract covers building from existing foundations up, and does not include storage bin.

Wages in the area range from $2.20 for common to $2.78 for semi-skilled and $3.65 for skilled.

Contractor must furnish all materials, which will be trucked.

The ten bidders include:

1C	John Bowen Co., Inc., Dorchester, Mass.	$2,693,793
2	Vappi Co., Inc., Cambridge, Mass.	2,788,639
10	J. F. Fitzgerald Constr. Co., Boston	3,048,300
EE	Metcalf & Eddy, Boston	2,600,000

Subcontracts accounting for 36.1% of the total contract were:

	Amount	% of Total Contract
RI-Co Iron Metal, Inc. Misc. metalwork	$56,280	2.1
Federal Sheet Metal & Roofing Co. Roofing and flashing	34,969	1.3
Willis & Hill, Inc. Metal sash	33,962	1.3
Boston Plate & Window Glass and glazing	6,264	0.2
Waghorne Brown Co. Glass wall	50,640	1.9
W. F. Cannon Roof light panels	5,210	0.2
Freeport Marble Ceramic tile	10,450	0.4
Edw. D. Walsh Lathing and plastering	82,000	3.0
Beckwith Elevator Elevator	14,989	0.6
J. M. McCusker Co. Plumbing	76,885	2.9
P. J. Riley Co. Mechanical work	423,670	15.7
Wm. Gens & Sons Electrical work	130,498	4.8
J. W. Eagan Painting	45,196	1.7
Total subcontracts	971,012	

Completion: 12 months
Liquidated damages: $300 day

Materials and Labor Prices

Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Weed Products, Glass, Explosives, Chemicals: Last, Nov. 21; Next, Dec. 19
- Clay Products, Lime, Plaster, Paint; Roofing: Last, Nov. 28; Next, Dec. 26
- Wage Rates, Building Board, Lath, Insulation: Last, Nov. 28; Next, Jan. 2
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, Dec. 5; Next, Jan. 9

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.275	$5.10	$5.425	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.275	5.10	5.425	12.25	$6.225	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.425	12.25	6.225	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.425	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.275	5.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.975	.....	6.125	.....	6.225	.....	.....	.....	9.75	6.75	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$8.74	9.25	$8.43t	$52.00	$57.00	
Baltimore	9.45	8.45t	.....	42.00	46.50	
Birmingham	8.64y	8.60y	8.60y	66.25p	71.00p	
Boston	9.63q	8.25	8.25	46.50	51.00	
Chicago	8.79E	6.91gu	6.91gu	52.00‡	63.00‡	
Cincinnati	9.18ak	9.08rs	.....	43.50mn	48.00mn	
Cleveland	9.01	6.89c	.....	44.50‡	49.00‡	
Dallas	10.25	8.85	8.85	61.00	66.50	
Denver	9.90	8.95c	.....	57.00n	63.00n	
Detroit	9.18	7.15g	.....	45.00	49.50	
Kansas City	9.31a	8.10	.....	49.00	60.00	
Los Angeles	9.35fd	7.35	.....	57.00	63.00	
Minneapolis	9.08d	9.26b	9.26b	41.50	46.00	
Montreal	8.70-9.00C/8.30-9.40A	7.75/9.95F	7.75/9.95F	65.70A	70.20A	
New Orleans	.....	8.60gks	.....	45.50	50.00	
New York	9.45z	8.35v	8.35y	50.50n	57.00nz	
Philadelphia	8.80/9.00	7.80/8.00	.....	42.50‡	47.00‡	
Pittsburgh	8.64y	7.10y	.....	46.00‡w	49.50‡w	
St. Louis	9.10z	8.45c	8.45c	61.00f	62.00f	
San Francisco	9.80	9.45j	.....	51.00	54.00	
Seattle	9.80D	8.85e	.....	62.00nr	68.00nr	
Toronto	8.85*	7.85	7.85	59.50mq	62.75mq	

Quantity extras, per cwt: under 100, +$1; 100-399, +$.50; 400-999, +$.30; 1000-1999, +1.00; 2000-4999, base price; 5000-9999, −10c; 10,000-19,999, −30c; 20,000-29,999, −50c; 30,000 and up, −70c

EXTRAS, per cwt: ◆Quantity (applies to L/T shipments only): under 1,000, +$1.80; 1000-1999, +$1.50; 2000-4999, +$1.20; 5000-9999, +90c; 10,000-19,999, +60c; 20,000-29,999, +30c; 30,000-39,999, +10c; 40,000 & up, none. ◆Size: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70c; #6, #7, #8, #9, #10, #11 +50c. ◆Bending: heavy, +90c; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ◆Engineering details and sharing from designs by others: over 500 tons, +45c; 200-499 tons, +50c but not over $4500; 75-199 tons, +65c but not over $2000; 20-74 tons, +75c but not over $975; 5-19 tons, +85c but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60c.

*‡ Delivered. ** Aver. of Canadian & American. *a 2000-9999#. *b 10,000-15,999#, fob city *c 20 tons or over *d 10,000-19,999#. *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000-4,999# *t add 16.5c del. *u add 6.25c switch *v incl 15c del. *w truck lots. *y add 15c del. *z add 10c del. *A American made. *C Canadian made. *D ½% for cash. *E 30,000# or over. * F Federal tax exempt.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX‡a	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 12" Sew Cl. I	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 8 in.	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 12 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 24 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 6 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 8 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 12 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 24 in.
Atlanta	130.5	$1.64	$2.68	$.83	$.98	$.	$.	$334.00z	.....	$1.55m	$4.40m
Baltimore	140.4	1.64	2.46	665	1.28	5.08s	12.71	187.80	$289.20	1.01	2.75m
Birmingham	125.8	1.64	2.68	46	.86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	143.5	1.66	2.46	763rt	1.4715qrt	6.075qrt	.....	215.40r	330.60r	1.56mg	3.47mg
Chicago	140.9	1.64	2.46	93m	1.78m	7.52m	21.16m	220.00n	330.00n	1.30	4.00
Cincinnati	135.5	1.66	2.55	665t	1.2825t	4.905t	12.505	240.00	370.00	85m	3.25m
Cleveland	141.7	1.66	2.55	567s	1.0935s	4.545t	11.7875t	155.40m	240.60m	85m	3.50m
Dallas	137.8	1.66	2.80	439	.799	4.006	9.175	.....	.....	1.04	2.10
Denver	148.2	1.73	2.80	47n	84n	3.73n	.....	.....	.....	75m	2.75m
Detroit	142.1	1.66	2.55	90n	1.70n	6.50n	18.50n	164.80m	254.20m	1.10	4.05
Kansas City	138.5	1.66	2.55	61	1.105	4.47	11.56	275.00	485.00	.95	2.90
Los Angeles	148.6	1.73	2.46	74l	1.61l	6.42l	15.36l	370.00l	530.00l	1.12	3.32l
Minneapolis	149.9	1.68	2.68	86mo	1.55mo	6.70mo	.....	.....	.....	2.13h	5.74h
Montreal	.....	.....	.....	1.07u	1.90u	6.80u	12.50u	288.00	545.00	1.17h	3.11j
New Orleans	133.3	1.64	2.68	528	.983	5.10	.....	210.50p	468.00	85	2.90
New York	138.7	1.66	2.46	1.02	1.94	7.56	19.48	.....	.....	1.50	3.00
Philadelphia	138.0	1.64	2.46	68	1.31	5.13e	14.25e	300.00‡	350.00‡	1.75h	4.20h
Pittsburgh	142.9	1.66	2.46	595m	1.15m	4.73m	12.40m	190.00	295.00	1.45z	3.50z
St. Louis	136.9	1.64	2.55	59	1.08	4.45	10.80	180.00l	380.00l	1.45kl	3.10kl
San Francisco	148.6	1.73	2.46	78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.06m	3.30m
Seattle	149.0	1.73	2.46	67b	1.33b	6.84	.....	220.00c	.....	1.10k	3.25k
Toronto	.....	.....	.....	76	1.42S	6.00	.....	157.00	280.00	1.02	3.57

*‡ Extra quality *½ extra strength. *‡ delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. *b Extra strength. *c 4-in., $130. *d SS361-A *f 21 in. *g culvert pipe; reinf., ASTM C 75-56 *h reinf., ASTM C 75-54 *i reinf., ASTM C 76-55 *j centrispun; no standard specs. in Canada. *k 2% cash *l fob plant *m truck del. *n LCL del., fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 1 ft lengths *t 3 ft lengths *u CESA A 60-1941 *v standard strength *w SS; add 20% for d.s. *x fob city

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

	3½ to 6 in., Lap Weld+, Galv. %	3½ & 3 in., Butt Weld+, Galv. %	2½ & 3 in., Butt Weld+, Galv. %
Lorain, Ohio	6.25s †	0.50	16.75
Albuquerque, Pa	.....	3.00	16.75
Sparrows Pt., Md.	.....	1.50	14.75
Benwood, W. Va	6.25	0.50	16.75
Youngstown, O	+5	0.50	16.75
Indiana Harbor, Ind.	+11	0.50	15.75
Sharon, Pa.	6.25	0.50	16.75
Wheatland, Pa	+10	0.50	16.75
Etna, Pa	+9	3.00	16.75
Fontana, Calif.	+7	+13.00	3.25

Mill: Lorain, Ohio; Albuquerque, Pa; Sparrows Pt., Md.; Benwood, W. Va; Youngstown, O; Indiana Harbor, Ind.; Sharon, Pa.; Wheatland, Pa; Etna, Pa; Fontana, Calif.

	6 in.	8 in.	10 in.	12 in.
Lorain, Ohio	25.25s	25.25s	50.50s	50.50s
Albuquerque, Pa	8.00s	25s	50s	75s
Sparrows Pt., Md.	†	25s	50s	75s
Benwood, W. Va	25s	25s	50s	75s
Youngstown, O	+5	+5	+10	+10
Indiana Harbor, Ind.	+11	+11	+20	+20
Sharon, Pa.	25s	25s	50s	75s
Wheatland, Pa	+5	+5	+10	+10
Etna, Pa	50d	50d	+9	+9
Fontana, Calif.	+7	+7	+14	+14
	25ab	25ab	50ab	75ab
	+24.00ab	+24.00ab	+48.00ab	+72.00ab

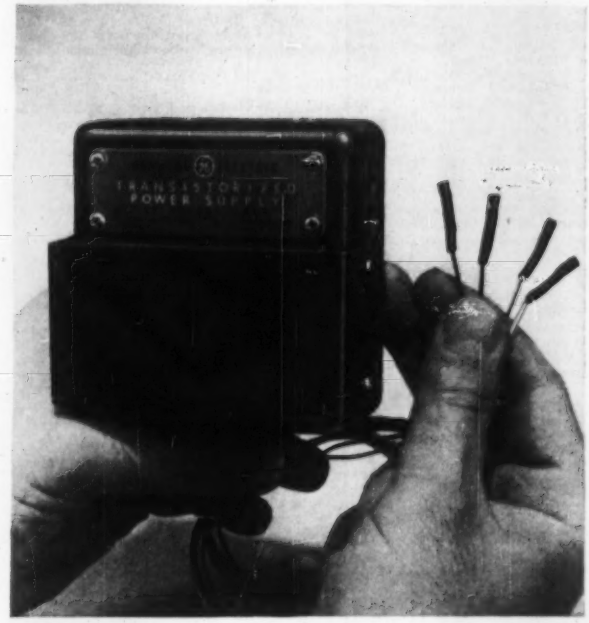
+Threaded and coupled. ** Continuous weld. a 3½ to 4 in. b 6 in. d 6 in.

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.("based on approx. $200 per net ton): Butt Weld ⅛ in., 8½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 95.23, 1½ in. black, + 81.79 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 84.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

General Electric announces

New transistorized power supply for two-way radio



General Electric now brings you the vastly improved reliability of transistors — *without obsoleting your present equipment!*

The all-new General Electric Transistorized Power Supply—part of G.E.'s advanced Progress Line—replaces the receiver portion of the mobile power supply and eliminates the receiver vibrator.

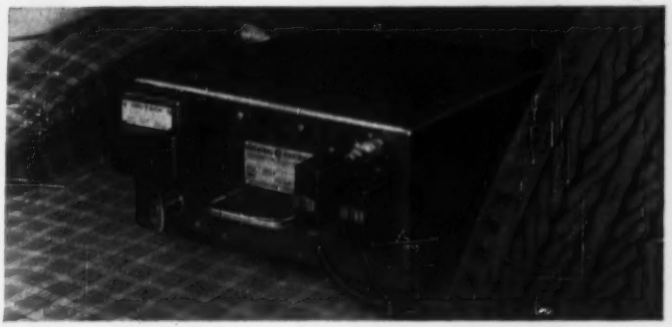
Here's what this means: Previously you had to replace receiver vibrators several times a year. Our surveys indicate each replacement costs you from $10 to $18, depending upon service call mileage. Now you can install a power supply costing only $54.50 (when installed in new equipment at the factory, just $44.50) which has the same life expectancy as your entire mobile combination. *The new G-E Transistorized Power Supply will easily pay for itself the first year or two on vibrator replacements and service calls!*

Easy to install—Three mounting studs fasten the new unit to the front of your case or inside the older, two-unit design equipment. Electrical connections are simple: only four leads to attach.

Eliminates "Vibrator Hash" — All traces of the "vibrator hash" which interferes with clear reception are gone for good.

Easily added to any 12-volt system — The new power supply can be used with all standard makes of two-way equipment which operate from an ordinary 12-volt power source.

Saves you money when drivers forget—When drivers neglect to turn off their radios before starting a vehicle, the new transistorized power supply cannot be damaged.



Progress without obsolescence — The addition of the new unit to your present mobiles, no matter what make, improves performance, reduces maintenance cost, and adds to the life of your equipment. *There is absolutely no need to buy complete new mobile units to enjoy the advantages of transistors.*

See for yourself how much you save—buy a new unit or several units and try them in your own 12-volt mobile units. Call your G-E communications consultant, listed under "Radio Communication Equipment" in the Yellow Pages. Or order direct by writing General Electric Co., Communication Products Dept., Syracuse, N. Y.

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J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲† **Mass., Bedford**—SCIENCES LABORATORY—BA 12/19—U. S. Eng., 150 Causeway St., Boston, interior constr. of utilities in Sciences Laboratory, Bldg. C, Cambridge Research Laboratory, Laurence G. Hanscom Field. $1,250,000-$1,500,000. Plans deposit $10.

▲ **MASSACHUSETTS**—BA 12/10—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

Erving, Orange and Wendell—relocation Section Rte. 2, FAP F-34B (3), $1,200,000. Plans deposit $20. Extended date. CD 11/13.

BUILDINGS—BA

R. I., **Providence**—DORMITORY—BA 12/17—Brown University, Barnaby C. Keeney, pres., Prospect (selected list of bidders) alterations (dormitory) to Hope College. $400,000. Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., archts. CD 2/14.

▲ **Mass., Quincy** HOSPITAL—BA 12/20—City, Hospital Dpt., Mayor's Office, City Hall, surgical wing addn. to hospital, Whitewell St. $2,000,000. Plans deposit $75. Coletti Bros., 687 Boylston St., Boston, archts. CD 10/22/56.

† **Me., Winter Harbor**—HOUSING—BA 1/7—1st Naval Dist., Dpt. Navy, 495 Summer St., Boston, Mass., NBy (CH) 16-135, Capehart Housing, U. S. Naval Radio Station. $145,000. Plans deposit $40. William O. Armitage, 25 Mitchell Rd., South Portland, archts.

▲ **Conn., Wethersfield**—LIBRARY, etc.—BA 1/10—Town, Town Hall, 150 Main St., 3 story, 72x120 ft. masonry library and 56x156 ft. town hall, Silas Dean Hy. $1,350,000. Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, archts. Jerome F. Mueller, 15 Lewis St., Hartford, engr. CD 8/2.

BUILDINGS—SLC

▲ **Mass., Quincy**—OFFICE—Bethlehem Steel Co., Shipbuilding Div., 97 Howard St., soon lets contract office bldg., Atomic Research laboratory addn. $1,000,000. Perry, Shaw, Hepburn & Dean, 31 St. James Ave., Boston, Mass., archts. CD 6/19.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

Ricciardi & Sons Constr. Inc., 219 Ludlow St., Worcester, Mass., LB $132,227, est. $146,971, Chapter 90 Hy. work and bridge work, Worcester. Bids Nov. 26. CD 11/20.

BUILDINGS—LB & CA

▲ **Minat Corp.**, 34 Preble St., Portland, Me., Owner Builds, Approx. $5,000,000, HOUSING DEVELOPMENT, near Nason's Corner, incl. former Hamlet Farm, PORTLAND, ME.

Mozzicato Constr. Co., 168 Mystic Ave., Medford, Mass., CA $681,133, 3 story DORMITORY addn., BOSTON, MASS. Emanuel College, 400 Fenway St., Boston, Mass. Bids Nov. 13. CD 11/27, under LB.

General Electric Co., 140 Federal St., Boston, Mass., LB $770,200 (Base Bid), one 12,500 kw. TURBINE GENERATOR UNIT, East Braintree, BRAINTREE, MASS. Town of Braintree, Municipal Light Bd., Light Dpt., 44 Allen St., East Braintree, Mass. Bids Dec. 12. CD 11/20.

C. J. Maney Co., Inc., 173 Bedford St., Lexington, Mass., CA Approx. $300,000, WAREHOUSE and OFFICE, Lift and Guest Sts., BRIGHTON, MASS. The Shlitz Distributing Co. of Mass., 301 Vassar St., Cambridge, Mass. CD 10/24.

▲ **City, Supt. Bldgs.**, City Hall, Haverhill, Mass., rejected bids Nov. 1, addn., alterations to Hale Hospital, Buttonwoods Ave., HAVERHILL, MASS. LB $1,100,000, est. $750,000. CD 11/7, under LB.

Owner, c/o Realty Constr. & Engineering, Inc., 51 Parramatta Rd., Beverly, Mass., Separate Contracts, $350,000. RESIDENTIAL DEVELOPMENT, 16 houses "Saunders Estates" of 894 Main St., LYNNFIELD CENTER, MASS.

▲ **Grande & Son, Inc.**, 17 Maplewood St., Malden, Mass., CA $1,269,900, SENIOR HIGH SCHOOL, Plain and Forest Sts., MARSHFIELD, MASS. Town, Secondary School Bldg. Comn., New St., Marshfield, Mass. Bids Nov. 21. CD 10/28.

▲ **Michael M. Iodice**, 151 Warren St., Watertown, Mass., rejected bids Nov. 20, 17 APARTMENT BUILDINGS, Warren and Lexington Sts., WATERTOWN, MASS. $1,000,000. CD 11/14.

▲ **Dimeo Constr. Co.**, 511 Westminster St., Providence, R. I. CA $1,319,500, est. $1,300,000. Bids No. 182-3 4 and 5 Proj. HOS-4:0/1-2-3&4, GERIATRICS BLDG. No. 2 at Howard R. I. State Hospital, HOWARD, R. I. State R. I. & Prov. Plants, Div. Purchase, State House, Providence, R. I. Bids Nov. 4. CD 11/7, under LB.

Pierre H. Myers, Inc., 277 Main St., Putnam, Conn., CA $100,000, GRAIN STORAGE BLDG., 65 ft. high, 16 bins, DANIELSON, CONN. Charles M. Cox Co., 177 Milk St., Boston, Mass. Ronald Leathers, c/o owner, engr. Awarded Nov. 25.

F. H. McGraw & Co., 51 E. 42nd St., New York, N. Y., CA $500,000, 10,000 sq. ft. NUCLEAR FUEL CORES ASSEMBLY PLANT, Sandy Desert, MONTVILLE, CONN. Olin-Mathieson, Chemical Corp., 275 Winchester Ave., New Haven, Conn. CD 5/28.

C. & J. Bldg. Constr. Co., 2270 Whitney Ave., Hamden, Conn., CA Approx. $350,000, COLLEGE addn., NEW HAVEN, CONN. New Haven College, 51 Prospect St., New Haven, Conn. Bids Oct. 25. CD 10/21/57.

Harry Grossman Realty Co., 193 Bedford St., Stamford, Conn., Owner Builds. $494,500. 23 HOUSES, "Westwood Manor" West Norwalk, NORWALK, CONN.

Joseph Faitella, 191 Whiting St., Plainville, Conn., Owner Builds, $350,000, 5 APARTMENT BLDGS., PLAINVILLE, CONN. Newton L. Lockwood, 112 W. Main St., Plainville, Conn., archt.

▲ **Bregman Constr. Corp.**, 250 E. 43 St., New York, N. Y., CA $2,147,000, State PRISON, (first stage), SOMERS, CONN. State P. Wks. Dpt. 165 Capitol Ave., Hartford, Conn. Bids Nov. 13. CD 11/15, under LB.

▲ **Fairoaks Constr. Co.**, 227 Newfield Ave., Hartford, Conn., CA $1,504,000, JUNIOR HIGH SCHOOL, WINDSOR, CONN. Town, Town Hall, Windsor, Conn. CD 11/12, under LB. Bids Nov. 11.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

N. Y., **Brooklyn**—BUILDING FINISHES—BA 12/17—The Port of New York Auth., 111 Eighth Ave., New York, Zone 11, Contr. BP-140.005, building finishes Pier No. 2, Brooklyn-Port Authority Piers. Plans deposit $30. CD 11/1/55.

N. Y., **New York**—BA 12/18—Dpt. P. Wks., Municipal Bldg., Zone 7, Hunts Point Pollution Control Project, Bronx Boro, incl. Contr. 6A, Hollers Ave. Pumping Station and force main, structures and equipment; Contr. 6B, Hollers Ave. Pumping Station, ventilating; Contr. No. 6C, Hollers Ave. Pumping Station, plumbing; Contr. 6D, Hollers Ave. Pumping Station, electrical work. Plans deposit $25. CD 10/18.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**
PROPOSED WORK	
Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

Pa., **Greenville**—BA 12/20—Greenville Sanitary Auth., Municipal Bldg., sanitary sewerage sys., Sewage Treatment Plant Contr. 2, general constr.; Contr. 3, plumbing work; Contr. 4, heating work; Contr. 5, electrical work; Contr. 6, main intercepting sewer and Contr. 7, Saul Run, Vine St., Waugh Ave. and York St. sewers. Plans deposit $50. Chester Engineers, 601 Suismon St., Pittsburgh, Zone 12, engrs. CD 11/30/56.

† **New York**—BA On Or About 1/21—U. S. Eng., foot of Bridge St., Buffalo 7, N. Y., navigation aids, Canada Island to Chimney Point Section, St. Lawrence Seaway, St. Lawrence River, Serial No. CIVENG-30-023-58-24, for St. Lawrence Seaway Development Corp. CD 9/9/54.

BUILDINGS—SLC

▲ **D. C., Wash.**—APARTMENT—Realest Corp., 25 Broad St., New York, N. Y., soon lets contract 8 story, brick, cinder block, concrete apartment, 2900-39th St. N.W. $4,000,000. Berla & Abel, 2000 P St. N.W., archt. CD 8/26.

HEAVY CONSTRUCTION—LB & CA

NEW YORK—New York State Thruway Auth., Delaware Plaza, Elsmere,

O. W. Hubbell & Sons, Oneida St., New Hartford, N. Y., CA $239,890, est. $339,000, erecting 411,000 ft. fence along thruway. Bids Nov. 1, awarded Nov. 8. CD 10/17.

▲† **Al Johnson Constr. Co.**, Foshay Tower, Minneapolis, Minn., **Morrison-Knudsen Co., Inc.**, 150 E. 42 St., New York, N. Y., **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb. and **Cunningham Kiewit Co.**, 4229 Lafayette St., Omaha, Neb., LB $13,028,330, est. $6,211,390, navigation aids, South Cornwall Channel, St. Lawrence Seaway, St. Lawrence River, CIVENG-30-023-58-14, NEW YORK. U. S. Eng., foot of Bridge St., Buffalo 7, N. Y. Bids Oct. 22. CD 9/3.

Michael Harmonay Corp., 567 Yonkers Ave., Yonkers, N. Y., CA $618,450 Alt. C, Contract 897, heating and ventilating for steam tunnel, VALHALLA, N. Y. Dpt. P. Wks., Westchester Co., County Office Bldg., White Plains, N. Y. Bids Oct. 2, awarded Nov. 14. CD 10/4, under LB.

PENNSYLVANIA—Pennsylvania Turnpike Comn., Box 531, Harrisburg, Bids opened 11/20,

James H. Drew Corp., 515 Architects & Builders Bldg., Indianapolis 4, Ind. LB $235,103 (deep beam, galvanized) erecting 63,586 ft. median guard rail, Contr. 128, Westmoreland, Somerset and Bedford Counties. CD 10/30.

North Boro's Constr., 436 Perry Hy., Pittsburgh, Pa. CA $112,897 installing 6,000 ft. water line leading to and from College Hill Reservoir, BEAVER FALLS, PA. Beaver Falls Borough, Beaver Falls, Pa. Awarded Oct. 22.

Malcolm Crosbie Co., Mount Lebanon, Pa. LB $246,623, conversion of pumping station on Mission St. from steam to electric, MOUNT LEBANON, PA. Borough of Mount Lebanon, Mount Lebanon, Pa. Awarded Oct. 22.

BUILDINGS—LB & CA

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y., CA $1,660,000 general contract PUBLIC SCHOOL 279, Avenue "K" between E. 109 and 104 Sts., BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. Bids Nov. 12. CD 11/14, under LB.

Parkal Corp., 1726 L St. N.W., Wash.; D. C. Owner Builds. $468,000, constr. Section II, 12 STORES, Great Eastern Heights Plaza Shopping Center, DISTRICT HEIGHTS, MD. Joseph Saunders, 121 S. Columbus St., Alexandria, La., archt.

▲ **HRH Constr. Corp.**, 16 W. 46 St., New York 19, N. Y., LB $10,884,000 (1) Base Bid; LB $10,949,000 (2) Base plus additives (11 bidders) general contract CRIMINAL COURTS BLDG. and PRISON, Queens Blvd., Hoover Ave., 132 St. and 82 Ave., Queens Boro, KEW GARDENS, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids Nov. 27. CD 11/15.

Manshul Constr. Corp. 401 E. 76 St., New York 21, N. Y., LB $578,300 (7 bidders) general contract PUBLIC SCHOOL 179 modernization, Amsterdam Ave. and W. 101 St., NEW YORK, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, N. Y. Bids Nov. 27. CD 11/12.

▲ **Owner**, c/o Paul Resnick, 654 Madison Ave., New York, N. Y. Owner Builds. $5,000,000. 16 story APARTMENT, 35 E. 75 St., NEW YORK, N. Y. CD 11/21.

▲ **Paul Losick**, 128 River Edge Rd., Tenafly, N. J. Owner Builds. $1,250,000, 39 HOUSES, Ruckman Rd., to be known as Star View Gardens, East Hill Section, CLOSTER, N. J. Martin, Gebhardt & DePaola, 205 Broad Ave., Fairview, N. J., archts.

▲ **Riley Constr. Co.**, c/o The Berg Agency, 1 Pennsylvania Ave., Metuchen, N. J. Own Forces. $2,250,000, 104 HOUSES, Riva Ave. forming Farrington Estates, EAST BRUNSWICK, N. J. J. W. Hilton, 28 Oak Crest Rd., West Orange, N. J., archt.

(Continued on page 106)

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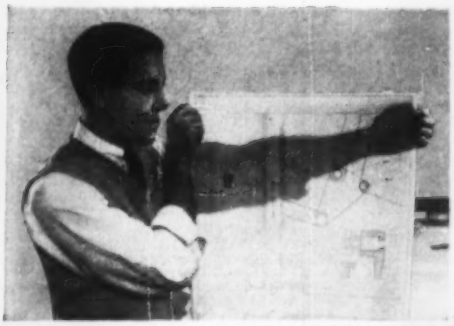

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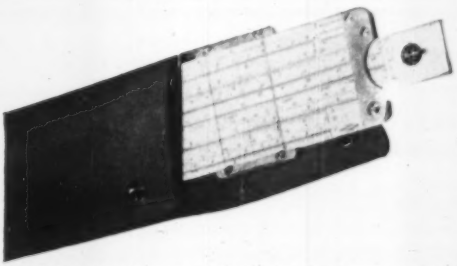

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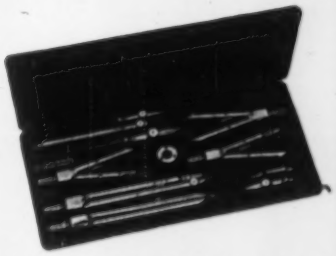

"Stainless-Supreme" Drawing Instruments. Draftsmen will do better work with the higher precision, durability and beauty offered only by instruments made entirely of **stainless steel.** Will not tarnish. 5 times harder than brass or German silver. Specially hardened, swivel-type ruling pen plates are easy to clean, will remain sharp.

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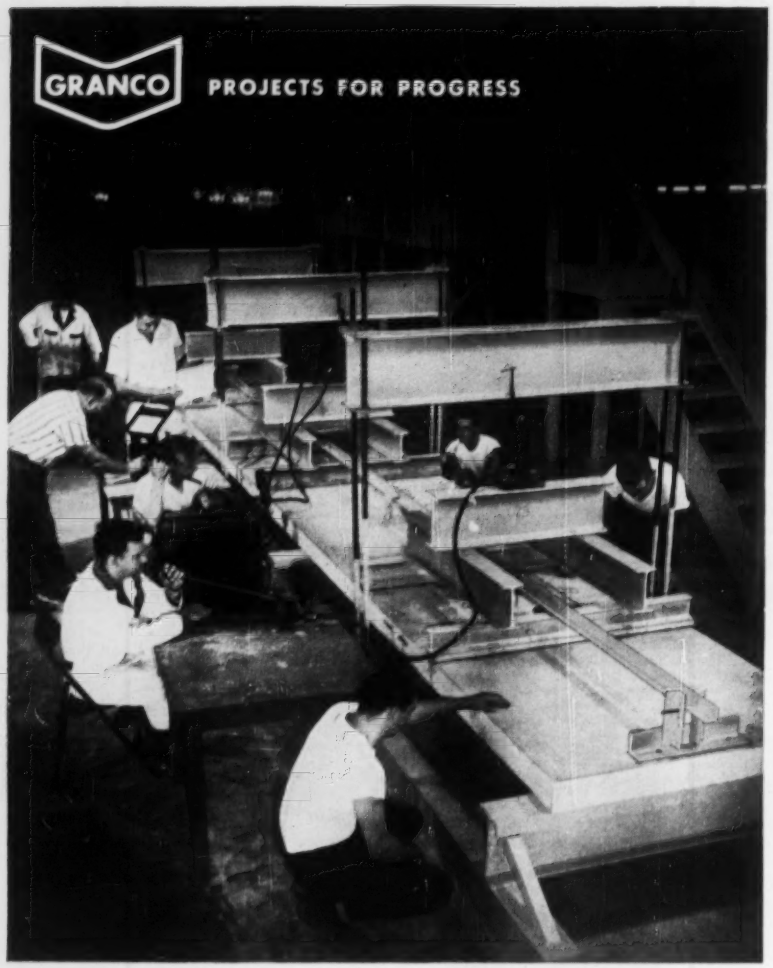

HOW A TEST "WROTE THE SPECS" ON ELECTRIFIED FLOOR SAFETY

How many pounds can a "Electrically Ready" floor slab with header ducts and junction boxes actually support? Here's how Granco found out... testing its own products.

In the photo above, research technicians of Granco Steel Products Company use hydraulic jacks with 60-ton capacity to apply increasing loads to a three-span test floor.

The 130-square foot floor system consisted of a structural concrete slab—formed and reinforced with 1) Cofar steel units, and 2) E/R Cofar units containing UL listed electrical raceways. Header ducts and junction boxes were attached to E/R Cofar units at the region of maximum moment.

As hydraulic jacks applied increasing pressure, sensitive gages measured stress and strain. Cofar and E/R Cofar units work together to support the load. In this test, the floor supported a 170-psf design load. Finally—at *6.8* times design load—the slab failed.

What does this test mean to *you?* It means you can depend on the safety of Granco products. We test *and retest* them to make sure design "specs" are accurate to the "nth" degree. *Like to see more data on the E/R Cofar test? Just drop us a card today!*

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6506 N. BROADWAY, ST. LOUIS 15, MO.

A Subsidiary of
GRANITE CITY STEEL CO.
Granco Distributors in 80 Principal Cities

(Continued from page 104)

Angelo Licciardello, 601 Wood St., Bristol, Pa. CA $344,000, 5 CORNERS SHOPPING CENTER, consisting 15 stores, LEVITTOWN, PA. Owner, c/o Michael J. Catalano, agt., 226 Mill St., Bristol, Pa. CD 5/22.

Coleman & Wood, Inc., 963 Selm Rd., Silver Spring, Md., CA $529,387, Western JUNIOR HIGH SCHOOL addn., Bethesda, ROCKVILLE, MD. Montgomery Co. Bd. Educ., Rockville, Md. Bids Nov. 21. CD 11/27, under LB.

Fred Drew Constr. Co., 1660 N. Fort Myer Dr., Arlington, Va., LB $214,000, Base Bid (10 bidders) DAIRY addns., alterations, WASH., D. C. Embassy Dairy, 1620 First St. N.W., Wash., D. C. Bids Nov. 22. CD 11/12;
Wm. H. Singleton Co., 1240 Jefferson-Davis Hy., Arlington, Va., LB $134,000, mechanical work for dairy addns., alterations (Wash., D. C.).

Wertheimer Constr. Corp., Arlington Towers, Arlington, Va., LB $805,958 (Base Bid), ELEMENTARY SCHOOL, vicinity of 56th and Eades Sts. N.E. (Drew Elem.), WASH., D. C., D. C. Govt., Dir. Bldgs & Grounds, 499 Pa. Ave. N.W., Wash., D C Johnson & Boutin, 1417 22nd St, N.W., Wash., D. C., archt. Bids Nov. 26. CD 11/15.

SOUTH

HEAVY CONSTRUCTION—BA

† **NORTH CAROLINA**—BA 12/18—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va., Proj. No. 2N7, imprv. intersection with N. C. Route No. 128, Blue Ridge Parkway. Bids Oct. 15 rejected. CD 10/21.

† **Va., Langeley**—BA 12/18—General Services Admin. 19th and F Sts. N.W., D.C., grading, drainage for roadways walks and parking areas. Central Intelligence Agency Headquarters Bldg. CD 8/7/56.

† **S. C., Beaufort**—UTILITIES, etc.—BA 1/15—Dist. P. Wks. Office, Bldg. No. 13, Naval Base, Charleston, FY-57, utilities and paving, Marine Corps Auxiliary Air Station, NBy 4974, Spec. 4974/56 (REV). CD 8/28/56.

† **S. C., Beaufort**—ELECTRICAL DISTRIBUTION, etc.—BA 1/15—Dist. P. Wks. Office, Bldg. No. 13, Naval Base, Charleston, electrical distr., fire alarm and street lighting, Marine Corps Auxiliary Air Station NBy 4975, Spec. 4975/56. CD 8/28/56.

BUILDINGS—BA

† **Ala., Montgomery**—ARMY RESERVE TRAINING CENTER—BA 12/18—U. S. Eng., 2301 Grant St., Mobile, Army Reserve Training Center on U. S. Hy. 80, about 1 mi. east of city limits.

▲ **Ky., Louisville**—SCHOOL—BA 12/21—Jefferson Co. Bd. Educ., 618 W. Jefferson, 3 story, no bsmnt., brick, rein.-con. Pleasure Ridge Junior High School. $1,100,000. Plans deposit $25. Hartstern, Louis & Henry, McDowell Bldg., Zone 2, archts., and E. R. Ronald & Assocs., 554 S. 3rd St., Zone 2, engrs. CD 9/19/56.

Va., Alexandria—SCHOOL—BA 12/23—Alexandria Bd. Educ., City Hall, Alexandria, Charles Houston Elementary School, addns., alterations, 900 block of Wythe St. Plans deposit $75. Williams & Chase, 300 Montgomery St., archts. CD 10/17/55.

BUILDINGS—SLC

La., Ville Platte—SCHOOL, etc.—Sacred Heart Catholic Parish, Ville Platte, soon lets contract school, convent and church, $600,000. Barron, Heinberg & Brocato, 1015 Wisteria St., Alexandria, archts.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., 1221 E. Broad St., Richmond,

B. G. Young & Sons, Inc., Lamont St., Johnson City, Tenn. CA $1,932,737. 3.49 mi., 2 lanes, 24 ft. x 7½ in c. conc. and bridge Rte. 402 begining at 0.48 mi. W. Int. Prop. Rte. 99, ending 0.36 mi. E. Int. Prop. Rte. 99 and 101, State Proj. 0402 077 001-002-005, Old State Proj. 8077-01-02-05, Fed. Proj. I-202-1 (14) Pulaski Co. Bids Nov. 20. CD 11/25, under LB.

† **Rea Constr. Co.,** Box 3725, Charlotte, N. C. CA $139,755. Est. $150,148. b. conc. overlay for secondary runway at Charleston Air Force Base, No. 38-081-57-02, CHARLESTON, S. C. U. S. Eng., Custom House, Charleston, S. C. Bids Nov. 5, awarded Nov. 6. CD 10/25.

T. A. Loving Co., Hy. 1-AN, Raleigh, N. C. CA $137,289. Sec. 1, water distr. sys., FOUR OAKS, N. C. Town, Town Hall, Four Oaks, N. C. Bids Oct. 30. CD 10/21.

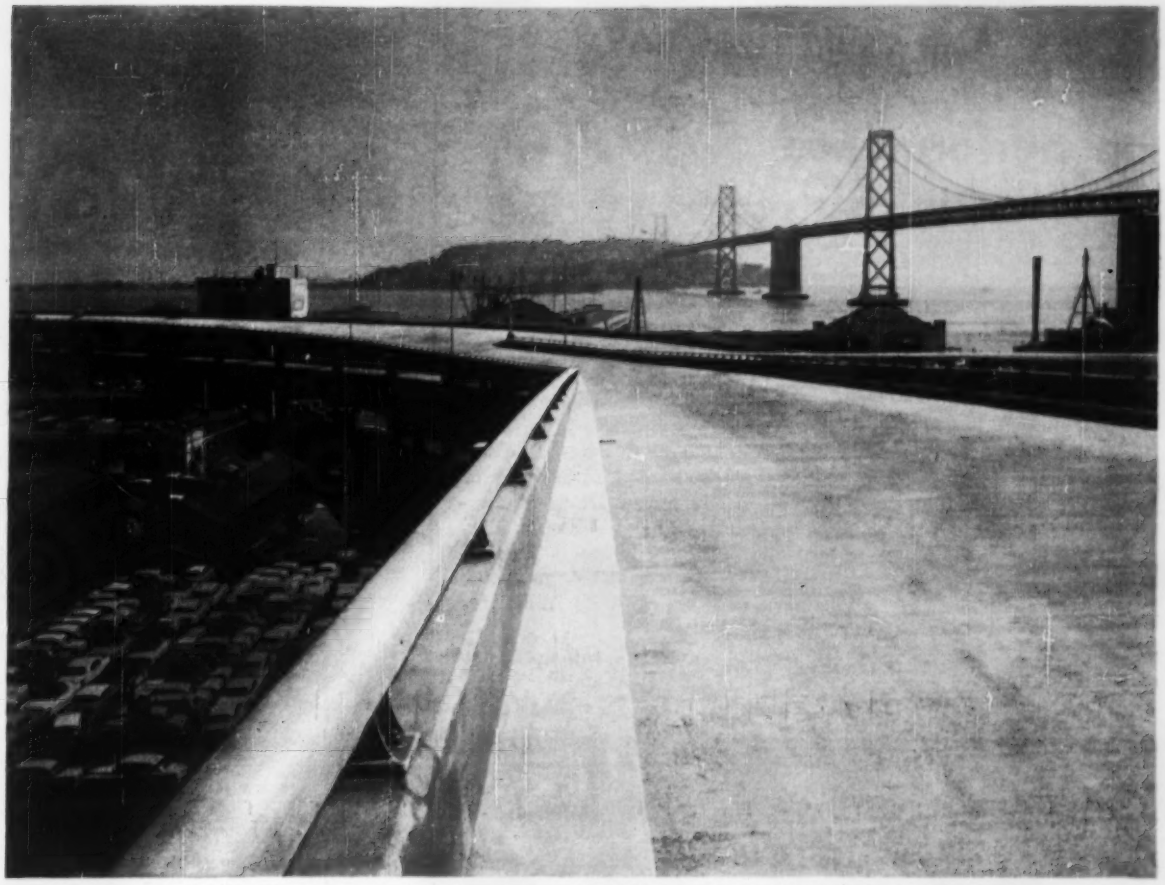
John R. Cook & Co., Inc., Martinez, Ga. CA $299,780. water distr. sys., Contr. "C", ATLANTA, GA. Fulton Co. Bd. Comrs., Roads & Revenues, 409 Admin. Bldg., Atlanta, Ga. Bids Nov. 13. CD 10/30.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee. Bids opened 11/26,

Fla.—**W. L. Cobb Constr. Co.,** Box 977, Tampa, Fla. LB $687,160. (8 bidders), limerock base, surf. tr., 23.141 mi. SR 674, Job 1012-150, Hillsborough Co.; LB $699,046, (6 bidders), limerock base, b. conc. surf. course with binder course, wid'n. existing 231.7 ft. concrete structure, quadruple 10 ft. span conc. box culvert, storm sewer 4.514 mi. SR 595, Job 1502-117, Pinellas Co.;

Fla.—**H. E. Wolfe Constr. Co.,** Box 1361, Et. Augustine, Fla. LB $1,523,903, (9 bidders), limerock base, b. conc. surf. course binder, small drainage structures 11.639 mi. SR 25, Job 2601-110, Alachua Co.; LB $1,852,373, (9 bidders), c. conc., limerock base with bit. surf. tr. limerock base with b. conc. surf. course

(Continued on page 108)



San Francisco Embarcadero Freeway; General Contractors, Charles L. Harney, Inc.; Railing Fabricator and Erector, Beaumont Furnace and Sheet Metal Corp., San Francisco.

KAISER ALUMINUM RAILINGS CUT COSTS ON NEW SAN FRANCISCO FREEWAY

By offering important money-saving advantages over other materials Kaiser Aluminum railings are paying off on the new Embarcadero link of San Francisco's freeway system. Here's where the savings add up:

Economical fabrication and erection—Because they weigh so much less and weld so efficiently, Kaiser Aluminum railings are far easier to work with—go up fast at minimum expense on any job.

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Beaumont Furnace and Sheet Metal Corporation, San Francisco, who fabricated and installed these railings, report that handling went much faster than usual—both at their shops and in the field. That's because a 10-foot extruded section of Kaiser Aluminum weighs only 43 pounds, a full 132 pounds less than its counterpart in steel. Welding was quickly and efficiently done.

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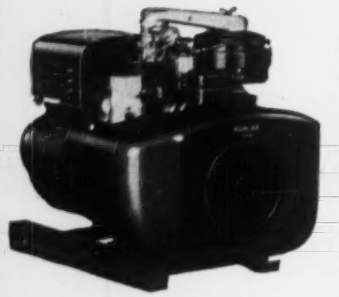

Model 5RM61, 5 KW, 115/230 volt AC. Air-cooled. Remote starting.

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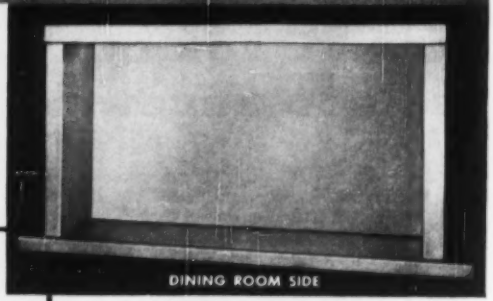
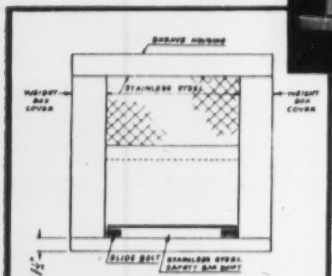


DINING ROOM SIDE



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THE RICHMOND FIREPROOF DOOR CO.
RICHMOND, INDIANA

(Continued from page 106)

and binder course, 3 box culverts, small drainage structures, 4 single conc. deck grade separation bridges, 5.208 mi. SR 400, (Job 1019-401), F.A.I. Proj. I-104-1 (5), Hillsborough Co.;

Fla.—**Construction Service Co.**, Valparaiso, Fla. LB **$80,609.** (4 bidders), grading, stab. base, 2.18 mi., Job 5754-159, Job 5761-154, Job 5761-155, Okaloosa Co.;

Fla.—**Hubbard Constr. Co.** Box 7217, Orlando, Fla. LB **$780,936** (3 bidders) limerock base, b. conc. surf. course with binder course, storm sewers 2.448 mi., Job 7502-106, SR 500, Orange Co.;

Fla.—**Cone Bros. Contr. Co.**, Box 1259, Tampa, Fla. LB **$607,052.** (15 bidders), limerock wid'n. overbuild or sand-asph. hot mix wid'n., leveling course, b. conc. surf. course with binder, extending existing single and multiple small drainage structures 14.449 mi. SR 15, Job 9206-112, Osceola Co.;

Fla.—**Florida Asphalt Paving Co.**, Box 1013, Panama City, Fla. LB **$135,193.** (4 bidders) stab. base, surf. tr. 3.785 mi. SR S-392-A, Job 4654-151, Bay Co.;

Fla.—**A. B. Covell**, Defuniak Springs, Fla. LB **$204,381.** (6 bidders), stab. base with surf. tr. 240 ft. concrete deck bridge on concrete piling 5.09 mi. SR-S-349, S-135 (2), Job 6067-25, Walton Co.;

Fla.—**Jas. H. Craggs Constr. Co.**, Box 22, Gainesville, Fla. LB **$362,751.** (4 bidders, limerock stab. base, limerock base with surf. tr. 2 box culverts, small drainage structures, 140 ft. concrete slab deck bridge on concrete piling 10.578 mi. SR S-220, F-418 (2) (Job 7158-250) and Job 7158-150 and 7158-151, SR-S-200, Clay Co.;

Fla.—**Ewell Eng. & Contr. Co.**, Box 791, Lakeland, Fla. LB **$237,720.** (9 bidders), rock base with surf. tr., 200 ft. conc. deck bridge on conc. piling, small drainage structures 5.52 mi. SR-S-676, S-444 (1), Job 1078-250, Hillsborough Co.;

Fla.—**Marion Constr. Co.**, Box 577, Ocala, Fla. LB **$258,327.** (9 bidders) limerock base with surf. tr., drainage structures 5.35 mi. S-S-19, S-449 (1), Job 7661-250, Putnam Co.;

Fla.—**Troup Bros., Inc.**, Box 168, Miami 33, Fla. LB **$280,326.** (10 bidders), limerock base with surf. tr., drainage structures 8.141 mi. SR-S-858, S-459 (1), Job 0353-250, Collier Co.;

Fla.—**Coggin & Deermont**, Chipley, Fla. LB **$308,508.** (9 bidders), limerock stab. base, with surf. tr., two 160 ft. and 140 ft. conc. slab deck bridges on conc. piling, small drainage structures 9.988 mi. SR S-158 and S-158A, S-469 (1), Job 5456-250, Jefferson Co. CD 11/13.

Kenneth Smith Constr. Co., Box 1031, 219 Magnolia Ave., Daytona Beach, Fla., CA **$564,674,** Airport Terminal Bldg. and Control Tower, Municipal Airport, DAYTONA BEACH, FLA. City, City Island Recreation Hall O. R. Allen, city mgr., Daytona Beach, Fla. Bids Oct. 29, awarded Nov. 20. CD 11/12/57, under LB.

† **James E. Smith & Son**, 2438 Crittendon Dr., Louisville, Ky., LB **$867,311,** air-conditioning post office and courthouse, Monroe and Julia Sts., JACKSONVILLE, FLA. U. S. A., Regional Director, Public Bldg. Services, 50 Seventh St. N.E., Atlanta, Ga.

† **W. L. Cobb Constr. Co.**, P.O. Box 977, Tampa, Fla., CA **$109,688,** concrete paving Hilding Pad, MacDill Air Force Base, ENG-08-602-58-5, TAMPA, FLA. Base Procurement Office, MacDill Air Force Base, Tampa, Fla. Bids Nov. 1. CD 10/30.

Wm. M. Cowgur & Co., 721 Olive St., St. Louis, Mo., LB **$312,410,** approx. 3,700 lin. ft. standard board revetment, Bossier Parish, Inv. 58-89, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Nov. 13. CD 10/18.

† **Wm. M. Cowgur Co., Inc.**, 721 Olive St., St. Louis, Mo., CA **$154,135,** repairs on pile dike on Red River, Avoyelles Parish, Inv. 58-69, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans 9, La. Bids Nov. 7. CD 10/11.

▲† **Hendry Corp.**, Rattlesnake, Fla., LB **$1,180,941,** dredging 7,291,000 cu. yd. channel thru Devil's Swamp, Baton Rouge Harbor, East Baton Rouge, CIVENG-16-047-58-718, LOUISIANA. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Nov. 8. CD 10/22.

▲ **KENTUCKY** — Commonwealth of Ky., Dpt. Hys., Frankfort, Bids opened 11/22.

Ky.—**Geo. M. Eady Co.**, Stanley Ave., Louisville, Ky., LB **$1,631,130** (5 bidders) b. conc. Class I surf. 0.625 mi. The Watterson Expressway in Louisville, Interchange at Taylorsville Road, I 05-1 (9) and 1 (8), SP 56-898, Jefferson Co.;

Ky.—**Northern Ky. Asphalt Co.**, Covington, Ky., LB **$251,018** (4 bidders) b. conc. Class I, 1.377 mi. The Newport-Maysville (Ky. 8) Road, revisions near Brent, near road to Lock 35 and lower Eight Mile Road to Upper Eight Mile Road, S 19 (4) SP 19-31 and SP-371, Campbell Co.;

Ky.—**Ky. Road Oiling Co.**, 315 High St., Frankfort, Ky., LB **$149,581** (6 bidders) traffic bound surf. 4.02 mi. The Isonville-Culver-Fielden (Ky. 486) Road from Ky. 32 approx. 0.6 mi. southeast of Isonville extending northeasterly to Culver, S 111 (4) SP 32-149, Elliott Co.;

Ky.—**John L. Burns, Inc.**, 851 Glendale Lane, Nashville, Tenn., LB **$151,820** (3 bidders) bit. surf. 0.284 mi. US 27 Bunker Hill Island Road from US 27 near south corporate limit Burnside to Bunker Hill Island, SP 100-665, Pulaski Co.;

Ky.—**Highland Constr. Co., Inc.**, 4416 Poplar Level Rd., Louisville, Ky., LB **$876,692** (5 bidders) grade, drain 1.893 mi. The Inner Belt Line in Louisville from north end of proposed interchange at US 60 to 441.9 ft. south US 42, I 05-1 (1), SP 56-628, Jefferson Co.;

Ky.—**John Woodruff Constr. Co.**, Cadiz, Ky., LB **$96,859** (6 bidders) traffic bound surf. 4.74 mi. The Old Hopkinsville Road from Ky. 407 approx. 0.75 mi. west

(Continued on page 111)

QUALITY and ECONOMY in COLD WEATHER CONCRETE FLOOR CONSTRUCTION

You can economically place high quality concrete floors in cold weather by using Sikacrete Accelerating Densifier.

EARLY STRENGTH – Sikacrete is a liquid admixture which causes rapid strength development in concrete and mortar. Sikacrete saves hours of overtime finishing and reduces the possibility of damage by freezing. Floors may be opened to traffic sooner.

STRUCTURAL BENEFITS – Sikacrete contains Plastiment densifying agent which gives these structural benefits: greater density, hard non-dusting surfaces, increased ultimate strength, and reduced cracking.

PLACEABILITY – The easy placeability of a stiff Sikacrete mix will surprise the most experienced concrete men. Sikacrete concrete with a 3" slump will be as easy to place as plain concrete with 5" slump. The excellent troweling characteristics will enable the finisher to provide a superior finish.

PROPORTIONS – Sikacrete proportions may be varied to suit job conditions. Normally 1½ gallons are used per cubic yard.

ECONOMY – In addition to lower finishing costs, early strength reduces both the time and cost of cold weather protection. You will increase structural quality and pocket savings greater than the cost of the Sikacrete.

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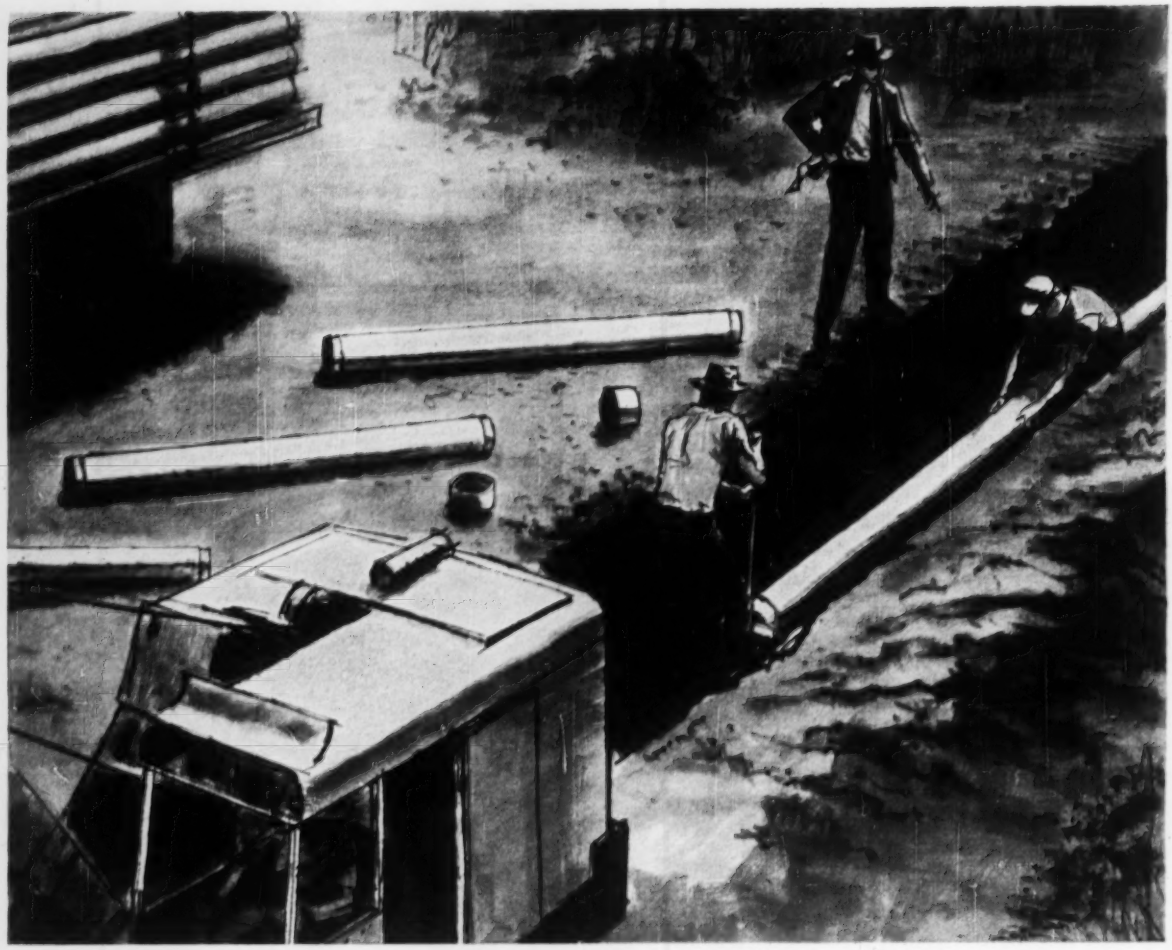

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Sectional view of Ring-Tite Coupling. Ring is cut away to show how rings are compressed and locked in grooves—*a tight, lasting seal!*

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With Transite® Pipe, installation crews move along fast! So fast, they consistently keep up with the excavator—installing pipe as rapidly as the trench can be opened.

Ease of handling and simplified assembly explain these advantages. Light in weight, Transite is easier to truck, easier to handle on the job. With the Ring-Tite® Coupling only simplest tools are needed for joining—pipe ends are automatically positioned within the coupling to allow for expansion.

So save while you assure city officials and engineers top economy, long trouble-free performance with Transite. For its smooth interior (flow coefficient is C=140) *often* permits selection of smaller diameter pipe . . . *always* keeps pumping costs low. And since Transite can't tuberculate, water systems can be designed without allowing for future flow reduction caused by that form of interior corrosion.

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JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE PRESSURE PIPE

(Continued from page 108)

US 41 to US 62 approx. 3 mi. west of Nortonville, RS 24-314 RS 54-230, Christian and Hopkins Counties;

Ky.—Arvie M. Burchett, Prestonburg, Ky., LB $184,505 (6 bidders) traffic bound surf. 4.977 mi. The White House-Lawrence Co. Line Road from White House to Lawrence Co. line, RS 58-817, Johnson Co.;

Ky.—Holloway & Son Constr. Co., Middletown, Ky., LB $308,142 (8 bidders) bit. surf. Class I 2.09 mi. The Whipps Mill Road from US 60 approx. 0.25 mi. west of Lyndon Lane to Ky. 146 at Ormsby Village, RS 56-93, Jefferson Co.;

Ky.—R. R. Dawson Bridge Co., Bloomfield, Ky., LB $96,849 (7 bidders) traffic bound surf. 3.078 mi. The Pine Grove-Humphrey Rd. from Ky. 70 at Pine Grove to approx. 1 mi. northwest of Humphrey, SP 23-501, Casey Co.; LB $294,936 (11 bidders) traffic bound surf. 6.069 mi. The Irvine-McKee Road from Ky. 851 at Wisemantown extending southerly to point approx. 0.4 mi. south Ky. 1209, S 12 (4) SP 33-63, Estill Co.;

Ky.—Thias M. Hook, Hardinsburg, Ky., LB $260,610 (4 bidders) traffic bound surf. 6.93 mi. The Cloverport-McQuady Road from near southeast corporate line of Cloverport and extending southeast to Hardinsburg-Mattingly Road, SP 14-813, Federal Hy. Funds, Breckinridge Co.;

Ky.—Greer Bros. & Young, London, Ky. LB $297,756. (5 bidders), traffic bound limestone 5.505 mi. The Gregory-Delta-Kidder Road, S 600 (2), RS 116-279, Wayne Co.;

Ky.—McDade & McDade, Fulton, Ky. and **Corbett Davidson & Son,** Mayfield, Ky. LB $523,560. (2 bidders), bit. surf. 6.885 mi. The Mayfield-Tri-City Tennessee State Line (Ky. 97) Road from Kentucky-Tennessee State Line, extending northerly to Tri City, S 646 (1) SP 42-128, Graves Co.;

Ky.—The Allen Co., Inc., Winchester, Ky. LB $234,965. (2 bidders), bit. surf., incl. section grade and drain, 0.975 mi. The Auxier-Van Lear (Ky. 1107) Road from Auxier to Van Lear, 6.721 mi. S 211 (3), SP 36-396, Floyd and Johnson Counties. CD 11/6.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort, cancelled bids to have been opened Nov. 22, bit. surf. 3.8 mi. The Paintsville-Van Lear (Ky. 302) Road, from bridge over Levisa Fork approx. 1.1 mi. southeast of jct. with US-23 and extending up Millers Creek to east corporate limit of Van Lear, SP 58-57, Johnson Co. CD 11/6.

† **U. S. Eng.,** P.O. Box 59, Louisville, Ky., rejected bids Nov. 13, Section "C" remedial work, Flood Protection, consisting approx. 37,000 cu. yd. excav., drainage structures, 36 in. corrugated metal culvert pipe, rein.-con. headwall, concrete flume, placing approx. 2,300 cu. yd. dumped riprap and seeding, Covington, CIVENG-15-029-58-29, KENTUCKY. $116,548. New bids Dec. 2. CD 11/25, under LB.

BUILDINGS—BA

ABCO Builders, 2220 College Ave. N. E., Atlanta, Ga., CA $778,830, East Atlanta HIGH SCHOOL, ATLANTA, GA. City Bd. Educ., City Hall, Atlanta, Ga. Bids Oct. 24, CD 10/9.

▲ **J. A. Jones Constr. Co.,** 133 Ellis St., N. E., Atlanta, Ga., LB $1,059,000, 3 womens' DORMITORIES, ATLANTA, GA. G. H. Mew, treas. Emory University, City Office, Candler Bldg., Atlanta, Ga. Robert & Co., 96 Poplar St. N. W., Atlanta, Ga., archts. Bids Nov. 19. CD 11/8.

R **A. Hollingsworth & Son,** Carrollton, Ga., CA $573,374, North Cobb HIGH SCHOOL, MARIETTA, GA. Cobb Co. Bd. Educ., 117½ Atlanta St., Marietta, Ga. CD 11/27, under LB.

▲ **Chalker & Mobley Co.,** 660 S. W. 27 Ave., Miami, Fla., LB $1,327,900, Rogers JUNIOR HIGH SCHOOL, S. W. 26 St. at 8 Ave., and Parkway JUNIOR HIGH SCHOOL, N. W. 37 Ave. and N. W. 5 St., FORT LAUDERDALE, FLA. Bd. P. Instruction, Dade Co., 1320 S. W. 4 St., Administration Bldg., Fort Lauderdale, Fla. Bids Nov. 21. CD 11/15.

Kaminer Constr. Corp., 4413 Peachtree Industrial Blvd., Chamblee, Ga. CA $538,656. general contract ELECTRIC UTILITIES EXPANSION, TURBINE ROOM addn., etc., FORT PIERCE, FLA. City, Police and Court Bldg., Fort Pierce, Fla. Bids Oct. 28. CD 9/30;
Whitmore Electric Co., Lansford Bldg., Miami, Fla. CA $197,087. electrical work, electric utilities expansion, Turbine room addn., etc., (Fort Pierce, Fla.).

▲ **G. W. Hallmark & Sons,** 3212 6th Ave., S., Birmingham, Ala. LB $1,117,970, est. $1,000,000. (6 bidders) 2 story addn. to SOCIAL SECURITY BLDG., BIRMINGHAM ALA. Pub. Bldg. Auth., City, City Hall, Birmingham, Ala. Bids Nov. 26. CD 10/22.

▲ **Sullivan & Cozzart,** 822 W. Ky. St., Louisville, Ky. CA $1,050,550. general contract and mechanical work, Fairdale JUNIOR HIGH SCHOOL, LOUISVILLE, KY. Jefferson Co. Bd. Educ., 618 W. Jefferson St., Louisville, Ky. Bids Nov. 25. CD 11/29, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Mich., **Detroit**—BA 12/17—At office M. F. Wagnitz, city engr., 528 City-County Bldg., Zone 26, Contract PR-147, package unit pumping station-sanitary sys. with two sewage pumps at West End of Belle Isle; Contract PR-148, package unit pumping station at Rouge Park for Dpt. Parks and Recreation. Plans deposit $10 each. CD 12/26/56.

Mich., **Detroit**—BA 12/8—City, George A. Schaffer, pres. Bd. Water Comm., 735 Randolph St., Contract WS-738, 5597 ft. 54 in. water main, appurtenances between Middlesex Ave. south of Donald and Ford Rd. west of Greenfield Rd. via Alber Ave. and Ford

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QUAKER RUBBER DIVISION

Woods Park, Dearborn. Plans deposit $10. G. Remus, c/o owner, ch. engr. CD 7/19/55.

Mich., Mason—BA 12/23—City, Harry Spanny, city clk., City Hall, sewage treatment plant addns., imprvs., incl. settling tanks, aeration tanks, secondary settling tanks, digested sludge beds, bldgs., plant sewers. Plans deposit $25. Wolverine Engr. Co., Mason, engrs.

BUILDINGS—BA

Ind., Griffith—SCHOOL—BA 12/17—School, Town of Griffith, 624 N. Raymond St., 1 story, brick elementary school. $400,000. CD 6/22.

Mich., Rochester—SCHOOL—BA 12/17—Bd. Educ., Rochester Community Schools, Rochester, Meadowbrook Elementary School addn. O'Dell, Hewlett & Luckenbach Assoc., 950 N. Humber Blvd., Birmingham, archts. CD 6/18.

Ill., Chicago—HOME FOR AGED—BA 12/23—United Lutheran Social Mission Society of Illinois, 5402 N. Magnolia Ave., 1 story, brick, stone Home for the Aged and Infirmary, Weeg, Way & Western, E. of Park Ridge. $350,000. Lowenberg & Lowenberg, 111 W. Monroe St., archts. CD 7/3.

BUILDINGS—SLC

Ill., Skokie—TEMPLE—Niles Township Jewish Congregation, Dempster St., soon lets contract, 2 story temple, Dempster St. and Kolmar Ave. $500,000. Sobel & Stein, 450 E. Ohio St., Chicago, archts. CD 8/30.

HEAVY CONSTRUCTION—LB & CA

Shaw-Comer Corp., 7016 Euclid Ave., Cleveland 3, O., LB $117,812 (7 bidders) repairs to Cumberland Pool, CLEVELAND HEIGHTS, O. City of Cleveland Heights, 2953 Mayfield Rd., Cleveland 18, O. Bids Nov. 22. CD 11/13.

▲ **N. S. Mackie Co.**, 228 N. LaSalle St., Chicago, Ill., LB $1,082,500, North Shore Channel dredging between Foster & the Sanitary Dist. Lock, Lincolnwood-Skokie Wilmette Counties, CHICAGO, ILL. Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. Bids Nov. 21. CD 11/25.

▲ **Santucci Constr. Co.**, 5025 Church St., Skokie, Ill., LB $1,999,190, Upper Des Plaines Intercepting Sewer, Contr. 11-d; ext. from west side of Mt. Prospect in Lincoln St., Central Rd., Rholing Rd., Kirchoff Rd., Blockway St. to southern limits of Palatine, Arlington Heights and Rolling Meadows, CHICAGO, ILL. Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. CD 10/8/57.

▲ **Standard Paving Co.**, 308 W. Washington St., Chicago, Ill., CA $1,392,544, paving 25.7 mi. village streets, sec. 18cs., FRANKLIN PARK, ILL. Village, Town Hall, Franklin Park, Ill. CD 1/7.

WISCONSIN—State Hy. Comn., State Office Bldg., Madison, Bids opened 11/26,

Wis.—**Farmer Bros.**, Tomah, Wis., LB $133,147 (8 bidders) grade, base and c. conc. pave. 0.494 mi. Main Street Bridge approaches, S.T. Hy. 26, City of Jefferson, Contr. 2, Proj. T 010(12), Jefferson Co.;

Wis.—**Robert W. Ryan Co.**, Janesville, Wis., LB $283,319 (9 bidders), grade, base and structures B-64-13 and B-64-14, 0.814 mi., Allens Grove-Darien (Bardwell Overhead and approaches) Road, S.T. Hy. 15, Contr. 1, Project. FG 015-1(6) and T 015-1(5), Walworth Co. CD 10/31.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison, Bids opened 11/26,

Wis.—**Badger State Constr. Co.**, 3140 W. Fond du Lac Ave., Milwaukee, Wis., LB $434,849 (13 bidders), grade, subbase and base and structures B-30-2 and B-30-3, 1.66 mi. S.T.H. 192-S.T.H. 31 Road, the C.M. St. P. and P. Railroad separation and approaches and the C. and N.W. railroad separation and approaches, S.T. Hy. 158, Contr. 1, Proj. S 0858(4), SG 0858(2) and SG 0858(3), Kenosha Co.;

Wis.—**The White Constr. Co.**, 710 N. Plankinton Ave., Milwaukee, Wis., LB $129,343 (9 bidders), b. conc. pavement 6.496 mi., west County Line-Grafton and Cedarburg-Five Corners Roads, S.T. Hy. 60 and 143, Contr. 1, Projs. S 0148(4) and T 0187(2), Ozaukee Co.;

Wis.—**Mathy Constr. Co.**, 524 Main St., La Crosse, Wis. LB $131,302 (6 bidders), bit. conc. 3.7 mi. Millston Merrillan Road, U.S. Hwy. 12, Contr. 1, Proj. T 06-3 (24) Jackson Co.;

Wis.—**Joe Jaeger Excavating Co.**, West Bend, Wis., LB $75,015 (11 bidders), gravel or crushed stone base course 11.979 mi., Allenton-Interchange-West County Line, and East County Line-North County Line Roads, U.S. Hwy. 41, Contr. 1, Projs. F 03-1(159) and F 03-1(60), Washington and Dodge Counties;

Wis.—**Tubesing Constr. Co.**, 16606 W. Greenfield Ave., Milwaukee, Wis., LB $255,800 (10 bidders), retaining walls, East-West Expressway (retaining walls, Milwaukee Gas Light Co., Gueder, Paeschke and Frey Co., and Red Star Yeast Co.), Interstate Hy. 94, Contr. 1, Projs. IN 102-2(13), IN 102-2(15) and IN 102-2 (15), Milwaukee Co.;

Wis.—**Wausau Constr. Co.**, 1308 West St., Wausau, Wis., LB $128,976 (5 bidders) grade, base and structure G-37-44, 2.463 mi., West Junction C.T.H. E and P-East Junction C.T.H. E and P Road, C.T. Hys. 1 and P, Contr. 1, Proj. S 018(4), Marathon Co. CD 10/31.

MICHIGAN—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing, Bids opened 11/20,

Mich.—**Canonie Constr. Co.**, South Haven, Mich., LB $111,827, est. $110,000 (12 bidders), remove bridge and constr. new bridge on Laberdee Road over Raisin River between Sections 29 and 32, CS 81 of 46-15-20 C1 (S 683 5), Lenawee Co.;

Mich.—**L. W. Lamb Co.**, Holland, Mich., LB $506,032 est. $580,000 (15 bidders), three bridges on US-31

southbound over Black River, County Rd. 452 and C. & O. R.R. tracks ½ mi. northeast of Holland, F B1 of 70-7-3 C3-RN F X1 of 70-7-3 C3-RN F B2 of 70-7-3 C3-RN (F 155 32), Ottawa Co. CD 11/12.

▲ **MICHIGAN**—State Hy. Comn., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing. Bids opened 11/20, Mich.—**Paul C. Miller**, Sparta, Mich., LB **$2,189,186**, est. $2,220,000 (20 bidders); dual b. conc. and aggreg. base course, 5 grade separations 6.04 mi. US-31 from Third St. in Ferrysburg north to Hile Rd., BM 61074 C3-RN BM 70016 C C2 RN B2 of 61-13-3 C1-RN BM B3 of 61-13-3 C1-RN BM B5 of 70-13 6 C1 RN BM B6 of 70-13-6 C1-RN BM B4 of 70 13 6 C1-RN, Muskegon and Ottawa Counties;

Mich.—**Lieth-Riley Constr. Co.**, 837 Emmett St., Battle Creek, Mich., LB **$102,506**, est. $120,000 (13 bidders), aggreg. base 42 ft. b. conc. with curb and gutter 0.407 mi. M-119 in Lawton and aggreg. base course wid'n., 44 ft. b. conc. with curb and gutter US-12 in Hartford, SS 80111 C1-U (S 319 8) F 80021 C1-U (F 31 3), Van Buren Co.; LB **$151,298**, est. $170,000 (10 bidders), aggreg. and concrete base wid'n., b. conc. surf. 2.035 mi. M-40 from 0.6 mi. southwest of Decatur, northeast and north to north limits of Decatur, M 80071 C1-R M 80071 C2-U, Van Buren Co. CD 11/1;

Mich.—**Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe, Mich. LB **$209,368**, est. $250,000 (13 bidders), 45 ft. concrete paving 1.269 mi. Utica Rd. from 13-Mile Rd. to Klein Rd., CS 50-63 C2 (S 566 2, Macomb Co. CD 11/8.

BUILDINGS—LB & CA

▲ **Ragnar Benson, Inc.**, 4744 W. Rice St., Chicago, Ill., CA **$15,000,000**, 10 SERVICE STATIONS; 5 RESTAURANTS and paving; W. of Midway, N.W. of O'Hare Field, near Belvidere, Lake Co. W. of Lake Forest; Du Page near Elgin, Cook, Boone, Lake and Dupage Counties, Illinois Toll Rd., ILLINOIS. Standard Oil Co., 910 S. Michigan Ave., Chicago, Ill. Pace Assocs., 53 W. Jackson Blvd., Chicago, Ill., archt.

Whittman Constr. Co., Wayne, Mich., CA **$464,835**, Charles F. Kettering Elementary SCHOOL, Birch Hills Subdivision-Cherry Hill Rd., WAYNE, MICH. Bd. Educ. Wayne Schools, 3714 South Wayne Rd., Wayne, Mich. Yamasaki, Leinweber & Assoc., 1025 East Maple St., Birmingham, Mich., archts. CD 3/1/56.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† **Colo., Denver**—JET FUEL and AVGAS SYSTEM, etc.—BA 12/17—Dist. P. Wks. Office, Ninth Naval Dist., Bldg. 1-A, Great Lakes, Ill., jet fuel and avgas system rehabilitation, Naval Air Station, Denver, Colo., NBy-12622, Spec. 12622/57.

† **North Dakota**—BA 12/19—U. S. Eng., Garrison Reservoir, Riverdale, hydraulic turbine governors and equipment, Garrison Dam and Reservoir Project, Units 4 and 5, INV-32-015-58-26. CD 9/9.

† **Tex., Fort Hood**—MOTOR REPAIR SHOPS—BA 12/19—U. S. Eng., Box 1600, Fort Worth, 2 battalion motor repair shops, ENG-41-443-58-4. Freese, Nichols & Turner, C&I Life Bldg., Houston, archts.-engrs. CD 11/22.

† **Arkansas**—BA 1/7—U. S. Eng., P.O. Box 60, Vicksburg, Miss., furnishing plant, labor, materials and equipment for constr. Calion Protection works, pumping station and control structure Union Co. CD 6/25/46.

† **Oklahoma**—BA 1/7—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Washita Basin Project, four 5-ft. high pressure gate valves for outlet works at Fort Cobb Dam, Fort Cobb, Spec. DS 4998. L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver, Colo., archt.-engr.

North Dakota—TELEPHONE LINE—BA 1/7—Dakota Central Rural Telephone Co-Operative Assn., Carrington, constr. 1114.42 mi. lines and four exchanges, Wells, Foster, Stutsman, Kidder and Eddy Counties. $600,000. Communications Consultants, 1114½ Main St., Fargo, engrs.

† **Minn., St. Cloud**—BA 1/21—Veterans Admin., Vermont Ave., between H and I Sts. N.W., Wash. 25, D. C., elevated water tank, Proj. 22-5131, $100,000-$150,000. Extended date. CD 11/15.

BUILDINGS—BA

Colo., Woodrow—SCHOOLS—BA 12/17—School Dist. No. 104, Washington Co., Woodrow, 1 story 40,000 sq. ft. grade school, $375,000., Robert W. Ditzen, 1135 Pearl St., Boulder, archt. CD 9/28/55.

† **Tex., El Paso**—G. M. RANGE TRAINING FACILITIES—BA 12/19—U. S. Eng., Box 1538, Albuquerque, N. M., six 80 man barracks, one 34 man BOQ, G. M. Range training facilities, Fort Bliss, ENG-29-005-58-15. CD 11/20.

† **N. M., Albuquerque**—STRUCTURE ADDN.—BA 12/27—U. S. Eng., Box 1538, "S" structure addn., Manzano Base, $100,000-$500,000. Extended date. CD 9/30.

† **Tex., El Paso**—G. M. LABORATORY, etc.—BA 12/30—U. S. Eng., P. O. Box 1538 Albuquerque, N. M. 2 story wing addn. to G. M. lab and classroom bldg., Fort Bliss, ENG-29-005-58-49. CD 11/20. Nov. 25. CD 11/26, underLB.

† **Tex., El Paso**—MATERIALS LABORATORY—BA 12/30—U. S. Eng., P. O. Box 1538, Albuquerque, N. M. 63x220 ft. masonry materials laboratory bldg. incl. gas, water, sewers, etc. Fort Bliss, ENG-29-005-58-50. CD 11/20.

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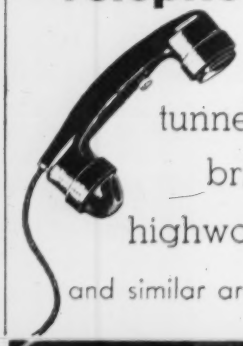

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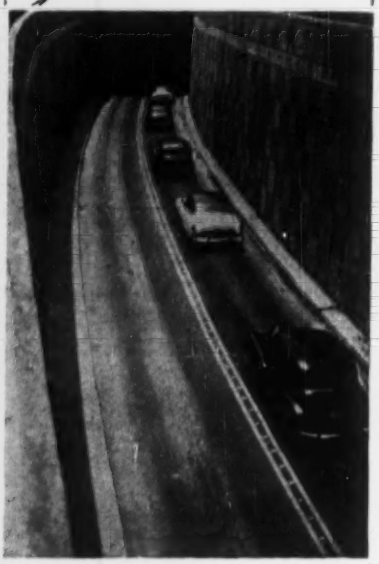

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Tex., **Midland—SCHOOL**—BA 1/7—Midland Ind. School Dist., Dr. Harold H. Hitt, supt. Schools, school addn. and remodel. $600,000. Plans deposit $50. Preston M. Geren, 1607 Fort Worth National Bldg., Fort Worth, archt. CD 11/7.

BUILDINGS—SLC

Wyo., Atlantic City—PLANT—Columbia-Geneva Steel Co., Russ Bldg., San Francisco, Calif., soon lets contract iron ore upgrading plant, here; also 45 mi. railroad to be built from Minton to Atlantic City.

HEAVY CONSTRUCTION—LB & CA

▲ **NEBRASKA**—State Dpt. Rds. & Irrigation, L. N. Ress, state engr., Lincoln,

Neb.—**Capital Bridge Co.**, 1001 N. 9th St., Lincoln, Neb. CA **$766,992**. 01-09-Lincoln-Omaha Rd. near Millard, Sarpy and Douglas Counties;

Neb.—**Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia., CA **$1,349,273**, grading, paving Lincoln Omaha Rd. near Millard, 01-09 Sarpy and Douglas Counties. Bids opened Oct. 17, awarded Oct. 29. CD 10/25, under LB.

† **M & A Constr. Co.**, Superior, Neb., LB **$584,066**, est. $665,221, earthwork and structures for Meeker Extension Canal, Station 1563 plus 15 to Station 2122 plus 17.6 and laterals, waterways and drains, Frenchman-Cambridge Div. Missouri River Basin Proj., near McCook, Spec. No. DC 4972, NEBRASKA. Bureau Reclamation, Dpt. Interior, McCook, Neb. Bids Nov. 26. CD 10/21.

Henry W. Miller Electric Co., 2501 St. Marys St., Omaha, Neb. LB **$357,600**, Contr. 247, all material work and material for wiring of Unit No. 3 at North Omaha Power Plant, incl. station, screenhouse, substation and yard facilities, OMAHA, NEB. Omaha Pub. Power Dist., 17 and Harney Sts., Omaha, Neb. Bids Nov. 14. CD 10/22.

▲ **KANSAS**—State Hy. Comn., State Office Bldg., Topeka, Bids opened 11/21,

Kan.—**Anderson & Oxandale Rock Co.**, Box 425, Herington, Kan., LB **$102,799** (4 bidders), AB base course 7.991 mi. beginning 4 mi. north of Glendale on Ottawa-Saline Co. line; thence south on County Hy., Proj. No. 85 S 409 (6), Saline Co. CD 11/1;

Kan.—**J. A. Tobin Constr. Co.**, 3701 Rainbow Blvd., Kansas City, Kan., LB **$749,480** (5 bidders), grading 5.925 mi. beginning approx. ½ mi. east of Olathe; thence southwesterly on new location US-50, Proj. No. 50-46 I 02 3 (10) Pt. II, Johnson Co. CD 11/11;

Kan.—**Grosshans & Petersen, Inc.**, Marysville, Kan., LB **$398,221** (4 bidders), grading 5.625 mi. beginning at Wabaunsee-Shawnee Co. line; thence west for additional lanes on US-40, SP 40-99 I 01-5 (29), Wabaunsee Co.;

Kan.—**Reno Constr. Co.**, Box 61, Overland Park, Kan., LB **$322,115** (10 bidders), grading 1.358 mi. beginning on Shawnee-Jefferson Co. line, approx. 185 ft north of present traveled way; thence westerly on new location of US-24, SP 24-89 F 072-1 (1), Shawnee Co. CD 11/11.

KANSAS—State Hy. Comn., Hutchinson, Bids opened 11/21,

J. A. Tobin Constr. Co., 3701 Rainbow Blvd., Kansas City, Kan., LB **$198,776** (6 bidders), twin 70 ft., two 96 ft., 70 ft. rein.-con. girder, Br. No. 50-46-13-4, Sta. 880 plus 18.24; LB $167,549 (6 bidders), twin 36 ft., 48 ft., 61 ft., 36 ft. rein.-con. hollow slab (railroad overpass), Br. No. 50-46-14.1, Sta. 917 plus 27.4; LB $94,343 (6 bidders), 78 ft., 104 ft., 78 ft. rein.-con. box girder, Br. No. 50-46-14.7, Sta. 944 plus 51.5, State Proj. Nos. I 02-3 (10), Pt. II, all in Johnson Co. CD 11/11, under Streets and Roads.

▲ **Douglas Constr. Co.**, 510 E. 15, Topeka, Kan., LB **$2,657,960**, Proj. 1, water plant imprvs., TOPEKA, KAN., City, City Hall, Topeka, Kan. Bids Nov. 12. CD 10/21.

W. B. Carter Constr. Co., 1224 N. Broadway, Wichita, Kan., LB **$776,405**, Sub-main Sewer No. 5, WICHITA, KAN. City, Robert H. Hess, dir. Water Supply & Sewage Treatment, City Hall, Wichita, Kan. Bids Nov. 22. CD 10/1.

OKLAHOMA—State Hy. Dpt., Capitol 5, Oklahoma City, Okla.,

Rejected bids, Nov. 13, grade, drain 6.899 mi. Hy. No. 10, east of the Nowata Co. line and Ext. E, Craig Co. LB **$102,969**. CD 11/4.

City Pub. Service Bd., Navarro and Villita Sts., San Antonio, Tex., Owner Builds. **$600,000**, electric transformers installations; **$100,000** regular street lighting extensions; **$140,000** natural gas belt lines extensions, SAN ANTONIO, TEX. Grand total $840,000. CD 3/8.

City Public Service Bd., Navarro and Villita Sts., San Antonio, Tex., Owner Builds. **$125,000** rerunning gas line services, over 40-year old; **$200,000** some overhead electric power lines; **$200,000**, imprvs. and remodeling power units at Villita St., SAN ANTONIO, TEX. Grand total $525,000. CD 3/8.

MONTANA—State Hy. Comn., Helena,

cancelled bids to have opened Dec. 19 grade, surf. bit. treat. 8.7 mi. Canyon Ferry-Clasoil Rozd Lewis and Clark Co. CD 11/20.

Nilson-Smith Co., 800 2 S., Great Falls, Mont. CA **$186,668** paving and street imprvs. on Broadway between Montana and Lamborn Sts. and on adjacent streets, HELENA, MONT. City, City Hall, Helena, Mont. Awarded about Nov. 26. CD 12/19/56;

Helena Sand & Gravel Co., Helena, Mont. CA **$74,635** paving Winne and Saunders Sts. (Helena, Mont.)

COLORADO—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Latimer Constr. Co., 930 Wyandot St., Denver, Colo., CA **$283,165**, Colo. Proj. No. 1 092-2(1) Unit 2, consisting of an overpass and approaches, total length 0.062 mi. on Valley Highway at Sante Fe Drive, Denver Co. Bids Nov. 22. CD 11/14.

† **Commonwealth Elec. Co.**, 1901 Y St., Lincoln, Neb., LB **$134,110**, misc. utilities, Phase 1, Air Force Academy site, IFG-05-613-58-19, COLORADO SPRINGS, COLO. Air Force Academy Constr. Agency, P. O. Box 1670, Colorado Springs, Colo. Bids Nov. 5. CD 9/30.

NEW MEXICO—State Hy. Dpt., State Hy. Bldg., Cerrillo Rd., Sante Fe,

Skousen Constr. Co., 208 Springer Bldg., Albuquerque, N. M., CA **$361,640**, est. $361,640 (3 bidders), 2 lane grade, drain base course, plant mix bit. surf. curb and gutter, 1-5 simple spans, steel stringer bridge 303.5 long on closed and steel pipe piling and misc. constr. 1.30 mi. on NM 17, Farmington Urban Fed. Aid Proj. No. F-033-2 (2), San Juan Co. Bids Nov. 15. CD 11/8, under Streets and Roads.

▲ **NEW MEXICO**—State Hy. Dpt., State Hy. Bldg., Cerrillos Rd., Sante Fe,

N. M.—**Henry Thygesen & Co.**, 424 Kinley Ave. N. E., Albuquerque, N. M., CA **$1,078,383**, est. $1,312,047, (3 bidders), 4 lane grade, drain base course, hot mix bit. surf., one interchange complete, one hy. grade separation, 4 major concrete box culverts and misc. constr. 4.610 mi. from the Texas-New Mexico State Line east of Anthony-North Fed. Aid Proj. No. I-091-1(7). Dona Ana Co.;

N. M.—**J. W. Jones Constr. Co.**, 8800 Susan Dr. S. E., Albuquerque, N. M., CA **$1,424,607**, est. $1,583,169, (3 bidders), 4 lane, grading, drainage, structures, base course, plantmix, bit. surf. twin bridges 506 lineal ft. long, 10 precast prestressed conc. simple spans and misc. constr. 5.959 mi. on U. S. 60085 between Socorro and Bernardo, Fed. Aid Proj. No. I-091-3(9), Socorro Co.;

N. M.—**K. Barnett & Sons**, Clovis, N. M., CA **$71,578**, est. $97,749 (3 bidders), 2 lane, grade, drain, base course, double penetration bit. surf. and misc. constr. 1.352 mi. on U. S. 60, 12.5 mi. east of Fort Sumner, Fed. Aid Proj. No. F-027-2(4), De Baca Co.;

N. M.—**Lorrenbaugh & Coe, Inc.**, 524 Montano Rd. N. W., Albuquerque, N. M., CA **$226,630**, est. $269,-705, (3 bidders), 2 lane, grade, drain, base course, 2 course surf. treatment, 1 bridge 8-25 ft. spans precast concrete bridge 202 ft. long on structural steel piles and misc. constr. 3.535 mi. on NM 290 from Jct. NM 4 toward Ponderosa Fed. Aid Proj. No. S-1321(1), Sandoval Co., Bids Nov. 15. Grand total $2,801,198. CD 11/8.

BUILDINGS—LB & CA

Klippen-Holm Co., 409 1st Natl. Bank Bldg., Duluth, Minn., LB **$523,039**, general contract HIGH SCHOOL addns., alterations, incl. swimming pool and expansion of GYMNASIUM, CLOQUET, MINN. Bd. Educ., B. O. Carlson, clk., Cloquet, Minn. Bids Nov. 26. CD 11/2.

▲ **St. John's University**, Collegeville, Minn., rejected bids Nov. 8, St. John's ABBEY CHURCH (basement and upper church 60x60 ft., chapter house), COLLEGEVILLE, MINN. LB **$1,663,000**. CD 11/18, under LB.

E. N. Conry Constr. Co., 2828 Harriet Ave., Minneapolis, Minn., CA **$200,000**, general contract 1 story, 32,416 sq. ft. WAREHOUSE and OFFICE, Xenia Ave., about 1-½ blocks north of Wayzata Blvd., GOLDEN VALLEY, MINN. General Tire & Rubber Co., 2402 University Ave., St. Paul 1, Minn.

D. Witcher, Inc., Bldrs. Exchange Bldg., Minneapolis, Minn., LB **$891,173** (10 bidders) HIGH SCHOOL addn. and new ELEMENTARY SCHOOL, LAKE CITY, MINN. Bd. Educ., L. Wichstrom, clk., Lake City, Minn. Bids Nov. 21. CD 10/23.

Adolfson & Peterson, 2817 Bryant Ave. S., Minneapolis, Minn., CA **$953,500** (12 bidders) HIGH SCHOOL addns. and remodel existing BUILDING; 8 CLASSROOMS, new GYMNASIUM, etc., OSSEO, MINN. Bd. Educ., L. C. Ward, supt. Schools, Osseo, Minn. Bids Nov. 26. CD 11/11.

Weitz Co., 406 Fleming Bldg., Des Moines, Iowa, CA **$886,050** (5 bidders) general contract LOOK MAGAZINE BLDG. addn., DES MOINES, IOWA. Cowles Magazines, Inc., 110 10 Ave., Des Moines, Iowa. Bids Oct. 22. CD 10/25.

▲ **Garner-Larimore**, Rogers, Ark., CA **$1,500,000**, 225,-000 sq. ft. prefab. metal, brick, concrete blocks FACTORY, 21 acre site between Hy. 71 and Frisco tracks, ROGERS, ARK. Rogers Development Corp., Rogers, Ark. John G. Hood & Assocs., 8 E. Michigan Ave., Ypsilanti, Mich., archt. Daisy Mfg. Corp., Plymouth, Ark., lessee.

† **Bureau Sport Fisheries & Wildlife**, 721 W. Lake St., Minneapolis, Minn., rejected bids Nov. 1, Contr. SFW3-55, heating system in SHOP, CARPENTER SHOP and RESIDENCES, Spec. CFW3-69. UPHAM, N. D. New bids Nov. 26. CD 10/25.

General Electric Co., Electric Bldg., Omaha, Neb. CA **$831,000**, Contr. 397, SUB-STATION, Jones St. Power Station, OMAHA, NEB. Omaha P. Power Dist., 17 and Harney Sts., Omaha, Neb. Bids Oct. 29. CD 11/27, under LB.

Builders Constr. Co., Republic Bldg., Oklahoma City 2, Okla., CA **$698,300**, est. $750,000. WOMENS DORMITORY, University of Oklahoma, NORMAN, OKLA. Bd of Regents, University of Oklahoma, Capitol, Oklahoma City 5, Okla. Richard N. Kuhlman, Norman, Okla., archt., and Sorey, Hill & Sorey, 806 N.W. 36 St., Oklahoma City, Okla., assoc. archts. (Correction-architects). CD 11/20, under CA.

▲† **Dicker, Frank & Assocs., Inc.**, 911 St. Joseph St., Dallas 10, Tex., LB **$7,635,000**, est. $7,500,000, 500

(Continued on page 116)

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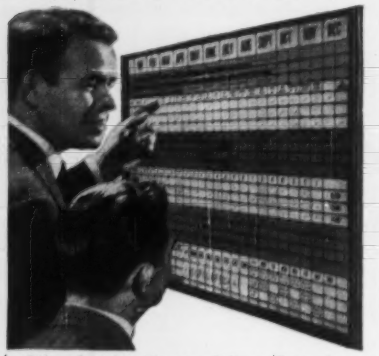

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(Continued from page 114)

unit CAPEHART HOUSING, Project No. AF-74, FHA 115-81009 Air No. 8, FHA No. 115-81010 Air No. 9 and FHA No. 115-81011, Laughlin Air Force Base, DEL RIO, TEX. Procurement Office, Laughlin Air Force Base, Del Rio, Tex. Bids Nov. 26. CD 10/22.

Blanke, Mech. Contractors, 2112 Mistletoe, Fort Worth, Tex., CA $646,900, est. $600,000, 18 story MEDICAL ARTS BLDG., incl. air conditioning and remodeling, FORT WORTH, TEX. Jessie Jones Interests, c/o Clay Berry, mgr., c/o Fair Bldg., Fort Worth, Tex. Bids Nov. 19. CD 10/7.

Pace Setter Homes, Inc., c/o Norman R. Dobbins, 5727 Northridge, Houston, Tex. Purchase and Hire. $378,000, 24 DWELLINGS; $349,000, 18 DWELLINGS, in Southview addn. in S.E. section of HOUSTON, TEX. CD 11/26.

Brown & Root, Inc., Box 3, Houston, Tex., CA $338,000, WAREHOUSE-MACHINE SHOP, HOUSTON, TEX. The Ladish Co., Cudahy, Wis. (Hdqrs.) and c/o Prudential Bldg., Houston, Tex. CD 12/2.

Parker & Snyder Constr. Co., 1981 Vernon St., Odessa, Tex., CA $750,000, 100 unit MOTEL, ODESSA, TEX. United Motels, Inc., W. B. Stowe, Odessa, Tex. CD 8/9, under Odessa Civic Hotel Assn., c/o R. T. Waddell, as owner.

Doolittle Constr., Inc., 335 N. Waco St., Wichita, Kan., CA $883,124, 5 story, bsmnt., sub-bsmnt., 43x104 ft. RESEARCH LABORATORY, BROOMFIELD, COLO. Colorado Research Corp., 4698 E. Evans St., Denver, Colo. Bids Oct. 9. CD 10/14.

AA-E. B. Jones Co., 1050 S. Jason St., Denver, Colo., LB $581,325, general contract 1 and 2 story George M. McMeen Grade SCHOOL, DENVER, COLO. School Dist. No. 1, 414-14th St., Denver, Colo. C. Francis Pillsbury, 320 Midland Savings Bldg., Denver, Colo., archt.-engr. Bids Nov. 13. CD 10/25.

Texas Lutheran College, Seguin, Tex., cancelled bids to have opened Nov. 19, WOMEN'S DORMITORY, SEGUIN, TEX. $350,000. Will readvertise. CD 11/12.

Sumner & Molesworth, Box 941, Roswell, N. M., CA $676,800, HOSPITAL addn., ALMAGORDO, N. M., Gerald Champion Memorial Hospital, Almagordo, N. M., Awarded Nov. 1. CD 10/17, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

† **Washington**—BA 12/19—Bureau Reclamation, Dpt. Interior, Ephrata, constr. earthwork for supplemental wasteways and drains, Block 72, Columbia Basin Proj., Spec. 117 C-481. L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver Colo., ch. engr. CD 9/10/56.

† **Wash., Everett**—BA 12/19—Procurement Officer, Paine Air Force Base, fire alarm sys., Inv. 58-15. Extended date. CD 11/25.

BUILDINGS—SLC

▲ **Calif., Long Beach**—HOSPITAL—Community Hospital, Terminal Ave. and Pacific Coast Hy., soon lets contract 6 story, bsmnt., rein.-con. hospital. $2,570,000. Hugh Davies, Top Floor, Security Bldg., 110 Pine Ave., archt. CD 9/5/46.

HEAVY CONSTRUCTION—LB & CA

IDAHO—State Hy. Dpt., Boise,
Idaho Rock, Inc., Twin Falls, Idaho. CA $418,834, constr. surf. and bit. surf. treatment 11.142 mi. and seal coat 9.611 mi. N.S. 26 and crushed gravel in stockpile, Bonneville Co. Bids Nov. 26. CD 11/19.

▲ **WASHINGTON**—State Hy. Comm., Olympia,
Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho. CA $14,226,690. floating and transition structures for bridge over Hood Canal, Kitsap Co. Bids Oct. 15, CD 10/17.

BUILDINGS—LB & CA

▲ **Mulcock Constr. Co.**, 255 E. 3 St., Salt Lake City, Utah. CA $1,000,000 BUSINESS DEVELOPMENT CENTER, incl. branch bank for Prudential Fed. S & L, auditorium and shopping center, 33 St. and State St. SALT LAKE CITY, UTAH. Prudential Federal Saving & Loan Assn. Thomas T. Taylor, pres., 125 S. Main St., Salt Lake City, Utah. CD 3/15.

H. Halvorson, Inc., 20054 Pacific Hy. S., Seattle, Wash. CA $629,977. general contract JUNIOR HIGH SCHOOL, MERCER ISLAND, WASH. School Dist. 400, Mercer Island, Wash. Bids Oct. 22. CD 10/29, under LB.

Todd Bldg. Co., Box 27, Roseburg, Ore., LB $523,299 (5 bidders) Central Linn JUNIOR and SENIOR HIGH SCHOOL, near HALSEY, ORE. Linn County School Dist., 552C, Albany, Ore. Bids Nov. 19. CD 11/8.

Cahill Constr. Co., 350 Sansome St., San Francisco, Calif., LB $345,000 (9 bidders) 18,000 sq. ft. new floor addn. to J. F. Hink & Sons DEPARTMENT STORE BERKELEY, CALIF. Owner, c/o Shubart & Friedman, archts., 52 Vallejo, San Francisco, Calif.

James I. Barnes Constr. Co., 1119 Montana Ave., Santa Monica, Calif. CA $655,400 general constr. LIBRARY addn. at Long Beach State College W. O. 3719GC 56, LONG BEACH, CALIF. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids Nov. 20, awarded Nov. 25. CD 11/26, under LB.

▲ **Bethlehem Pacific Coast Steel Corp.**, P.O. Box 2057, Terminal Annex, Los Angeles, Calif. CA $1,194,777. 9 story penthouse, bsmnt., structural steel frame State OFFICE BLDG., LOS ANGELES, CALIF. State Div.

(Continued on page 118)

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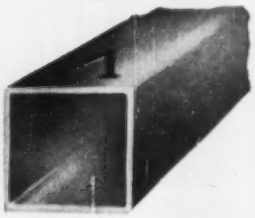

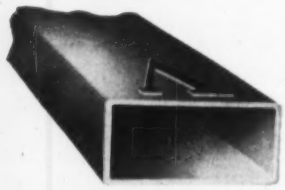

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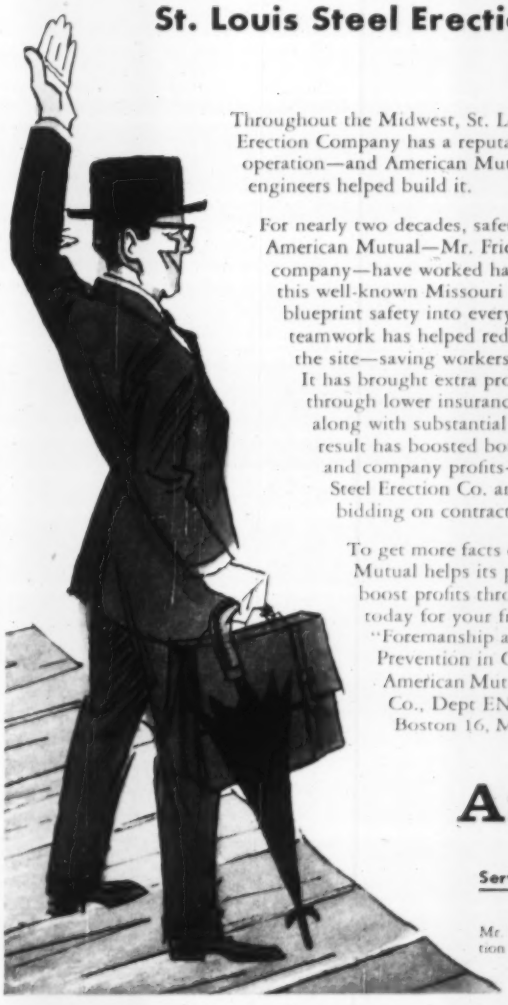

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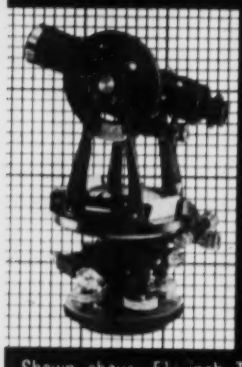
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(Continued from page 116)

Architecture, 1120 N. St., Sacramento, Calif. Bids Nov. 20, awarded Nov. 27. CD 11/26, under LB.

Trepte Constr. Co., 2001 Kettner Blvd., San Diego, Calif. CA $400,000 24,500 sq. ft. HOSPITAL, 3475 Kenyon St., SAN DIEGO, CALIF. San Diego Medical Assn., 1947 Cable St., San Diego, Calif.

A. S. Holmes & Sons, Inc., 9300 G St., Oakland, Calif. CA $500,000 TRUCKING TERMINAL on 8 acre site, 137th and West Ave., SAN LEANDRO, CALIF. Watson Bros. Transportation Co., 812 Fruitvale Ave., Oakland, Calif. CD 10/29.

CANADA

HEAVY CONSTRUCTION—BA

Que., Montreal—BA 12/18—City, City Hall, constr. subway under Canadian Pacific Railway tracks at Henri-Bourassa Blvd., west of Meilleur St. $700,000. Plans deposit $100. Beaulieu, Trudeau, Dubuc, Lalancette & Beaulieu, 6650 Darlington Ave., engrs. CD 12/6/56.

BUILDINGS—BA

Alta., Cardston—HOSPITAL—BA 12/18—Cardston Municipal Hospital Bd., 40-bed, steel, rein.-con. hospital. Over $400,000. Architectural Branch, Public Works Bldg. No. 2, Edmonton, archt. Plans deposit $75.

HEAVY CONSTRUCTION—SLC

Man., St. Boniface—REFINERY—North Star Oil Ltd., 272 Main St., soon lets contract add. 2 units to existing refinery, a unifier and platformer.

BUILDINGS—SLC

Ont., Toronto—FACTORY, etc.—British Drug Houses (Canada) Ltd., Barclay Ave., Etobicoke (Toronto Suburb) soon lets contract 1 story, 80x100 ft., factory addn. on ground floor with 40x120 ft. office addn. above existing structure, structural steel frame, masonry bearing walls, concrete block and poured concrete fdn. $300,000. John H. Parkin Assocs., 1500 Don Mills Rd., Don Mills, archts.

HEAVY CONSTRUCTION—LB & CA

Whelihan Constr. Co., Lethbridge, Alta., CA $158,183, constr. drainage channel and appurtenant structures near ENCHANT, ALTA. Alberta Govt., Terrace Bldg., Edmonton, Alta.

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Emil Anderson Constr. Co. Ltd., 4482 Main St., Vancouver, B. C., CA $1,437,594, Proj. 892, 1.31 mi. section Trans-Canada Rd., CPR Overhead, Saddle Rock Yale area. Bids 8/8. CD 9/12.

Commonwealth Constr. Co. Ltd., 700 Taylor St., Vancouver, B. C. CA $500,000, superstructure for new thermal generating station, PORT MANN, B. C. B. C. Electric Co., 970 Burrard St., Vancouver, B. C. CD 9/26.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
H. J. McFarland Constr. Co. Ltd., Talbot St., Picton, Ont., CA $697,981, Contr. No. 57-182 grading and gran. base, Hy. No. 17, from the Junction of North Bay by-pass to Hy. No. 94, 6.7 mi., North Bay. Bids Nov. 20, awarded Nov. 22. CD 11/27, under LB.

QUEBEC—Dpt. P. Wks., Parliament Bldgs., Quebec City,
Napoleon Trudel & Fils, St. Irenee, Que., CA Est. $500,000, 300 ft. bridge over Riviere aux Canards, St. Firmin, Charlevoix Co. Awarded Nov. 21. Olivier Desjardins, c/o owner, ch. bridge engr.

BUILDINGS—LB & CA

Burns & Dutton Concrete & Constr. Co. Ltd., 5440-1st St. S.W., Calgary, Alta., CA $368,470, (6 bidders) 2 story, bsmnt., 100 x 123 ft., rein. con. walls, columns and joist slabs, with provision made for an addnl. 2 stories, OFFICE BLDG. rein. con. fdn., 6th Ave., CALGARY, ALTA. Derrick Bldg. Ltd., c/o Clayton, Bond & Mogridge, 516-10th Ave. S.W., Calgary, Alta., archt. Awarded Nov. 18.

Burns & Dutton Concrete & Constr. Co. Ltd., 5440-1st St. S.W., Calgary, Alta., CA $368,470, 2 story, bsmnt. 100 x 123 ft. OFFICE BLDG., known as "Derrick Bldg.", 6th Avenue and 6th St., CALGARY, ALTA. French Petroleum Co. of Canada Ltd., Calgary, Alta. Clayton, Bond & Mogridge, 516-10th Ave., W., Calgary, Alta., archts. Awarded Nov. 20.

Smith Bros. & Wilson Ltd., 1267 Richards St., Vancouver, B. C., CA $800,000, 1 story, 50 x 125 ft. rein.-con. WAREHOUSE (for storage and shipping facilities, 2nd story addition to FERMENTING CELLAR STRUCTURE, VANCOUVER, B. C. Carling Breweries (BC) Ltd., 12th and Yew, Vancouver, B. C. Mercer & Mercer, 615 W. Hastings St. Vancouver, B. C., archts. Awarded Nov. 20.

Dell Constr. Co. Ltd., 2461 Bloor St. W., Toronto, Ont., CA $856,450 (7 bidders) 2 and 3 story with ground floor, 44 x 215 ft., structural steel frame brick exterior and plaster interior walls, HOSPITAL, alterations, addns, poured concrete fdn., COBURG, ONT. Coburg Dist. General Hospital Bd., Coburg, Ont. McGregor & Beynon Ltd., 2510 Yonge St., Toronto, Ont. engrs. Bids Sept. 23, awarded Nov. 18. CD 7/2.

Jains Investments Ltd., 1425 Weston Rd., Toronto, Ont., Owner Builds, $150,000, 1 story, 79x265 ft., structural steel frame, brick walls, FACTORY-OFFICE BLDG., concrete block fdns., Brown's Line, ETOBICOKE, ONT. Lipson & Dashkin, 6 Crescent Rd., Toronto, Ont., archt. Hallsall & Dowdell, 752A Yonge St., Toronto, Ont., engrs.

H. Winton Investments Ltd., 658 Bayview Ave., Toronto, Ont., Owner Builds. $400,000, 5 story, 40,000 sq. ft. with lift slab constr. OFFICE BLDG., Bayview Ave. and Hillsdale Ave. E., TORONTO, ONT. K. R. Cooper, 216 Merton St., Toronto, Ont., archt. Alex Tobias & Assocs. Ltd., 194 Wilson Ave., Toronto, Ont., engrs.

Desaulniers Constr. Ltd., 339 rue Compe, Montreal, Que. CA $725,000, 2 story, bsmnt., 136 x 195 ft. HIGH SCHOOL, Rene Huget St., LACHINE, QUE. La Commission Scolaire Catholique de Lachine, 110 15 Ave., Lachine, Que. Bids Aug. 29. CD 9/19, under LB. Awarded Nov. 22. Paul M. Lemieux, 1846 Dorchester St. W., Montreal, Que., archt. Jean F. Morin, 1532 Blvd. St. Joseph, Montreal, Que., assoc. archt. CD 9/19, under LB.

▲ **Lucien Vadeboncoeur & Cie. Ltee.**, 2320 Ste. Anne St., St. Hyacinthe, Que., CA $1,241,424 (6 bidders) 4 and 5 story, 60x100 ft. and 60x300 ft. brick, rein.-con. NORMAL SCHOOL, concrete fdn. with open air swimming pool, Maison Provincial, LAPRAIRIE, QUE. Les Freses de l'Instruction Chretienna, Maison du Sacre Coeur Laprairie, Que. Bids Nov. 7, awarded Nov. 21. CD 11/4.

Ernest Cote Ltee., 430 rue de Oblats, Quebec City, Que., CA $437,000, 2 story, bsmnt., 65x175 ft. rein.-con. frame SCHOOL for BOYS, and 2 story, bsmnt., 32x75 ft. concrete, brick RESIDENCE, QUEBEC WEST, QUE. La Commission Scolaire de Quebec-Ouest, Quebec West, Que. J. Aurele Bigonesse, 1310 rue Lemoine, Quebec City, Que., archt. Zachee & Pierre Langlais, 105 Cote de la Montagne, Que., engr. Awarded Nov. 20.

▲ **Roger Marcoux**, Hotel Commercial, Mont Joli, Que., Owner Builds $2,000,000, HOUSING, part lot 494 between lot 17 and Ave. Laure, SEPT ILES, QUE. Soudre & Latte, c/o owner, archts. CD 11/15.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲† **Honduras**—BA 12/19—Bureau P. Rds., Dpt., Commerce, Inter-American Highway Div., 18 and F Sts., N. W., Wash., D. C., U.S.A.
grading, draining, special sub-base, bridges and other work between El Salvador border and Nicaragua border, Honduras Project 56-1 (A).

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ind., Indianapolis**—Indianapolis Water Co., 113 Monument Circle, Zone 4, 7 billion gal. reservoir, electrification of Riverside station; purification plant and booster station in Crows Nest area. $14,000,000 (long range program). CD 8/3/53.

▲ **Me., Bangor**—Bd. Trustees Bangor Water Dist., P.O. Box 804, water supply imprvs. $3,000,000. Malcolm Pirnie Engineers, 25 W. 43rd St., New York, N. Y., engrs. Constr. 1958. CD 7/7/52.

▲ **Wash., Yakima**—City, City Hall, replace supply main from Oak Flat. $3,000,000. or drilling supply wells. $1,000,000. CD 2/15/49.

SEWERS, WASTE DISPOSAL

Calif., Benecia—City, City Hall, voted bonds Nov. 19, sewer imprvs. $855,000. CD 10/11.

Calif., Los Angeles—County Sanitation Dist. 14, 2020 Beverly Blvd., Los Angeles, 10,600 ft. 48 in. and 12,700 ft. 39 in. rein.-con. pipe, Rosamond Outfall Trunk Sewer, Lancaster. $750,000.

Mo., De Soto—City, City Council, City Hall, defeated $750,000 bonds Nov. 19, sewage disposal plant, auxiliaries, appurtenances and sewer extensions in various parts of city. CD 10/31.

▲ **N. J., Edison**—Edison Township, Township Hall, sewerage sys. addns. $1,286,000. Raymond P. Wilson, 46 Paterson St., New Brunswick, engr.

▲ **O., Cincinnati**—Hamilton Co., Court House, sewage treatment plant at Taylor Creek, east Miami River Rd. and Taylor Creek, $410,000. sewerage system for Taylor Creek, trunk sewer for Miami Station, $2,014,570. Constr. 1960. CD 7/6/46.
O., Mingo Junction—Village, Village Hall, voted bonds Nov. 5, for partial cost of sewage disposal system. $400,000. CD 10/9.

▲ **Wash., Seattle**—Lake City Sewer Dist., 3206 E. 125 St., voted bonds Nov. 19, sewerage sys. in area bounded by N. 185 and 90 Sts., Aurora Ave. and Lake Washington. $3,600,000. CD 11/11.

BRIDGES

▲ **Nebraska and Iowa**—Douglas County, Bridge Comn., 2912 Ames Ave., Omaha, Neb. new 4 lane bridge over Missouri River near Dodge St., from Omaha Nebraska to Council Bluffs, Iowa. $8,000,000. Harrington & Cortelyou, Dwight Bldg., Kansas City, Mo., and Kirkham, Michael & Assocs., 508 S. 19th St., Omaha, Neb., consult. engrs.

▲ **Tex., Orange**—Orange Co., c/o Courthouse, defeated bonds Nov. 16, bridge constr. $1,000,000. CD 10/29.

▲ **N. S., Halifax**—Nova Scotia Dpt. P. Wks. & Hys., Parliament Bldgs., constr. causeway-bridge across Bras d'Or Lake, Ross Ferry area in Victoria County, crossing will be link in new Trans-Canada Hy. $10,000,000. O. J. McCullough & Co., 45 Westminster St., Montreal, Que., consult. engrs. Bids soon.

STREETS AND ROADS

▲ **NEW YORK**—State Dpt. P. Wks., Gov. Alfred E. Smith State Office Bldg., Albany,
Cayuga Co.—9.4 mi. arterial highway in Auburn. $7,480,000.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Zone 50, Oklahoma City,
Beckham Co.—grading 7 mi. 4 lane Hy. No. 66 east of Elk City. $600,000;
Oklahoma Co.—grading 6 mi. 4 lane Hy. No. 77 north of Bradbury Corner. $750,000. G. H. Bittle, Capitol 5, Oklahoma City, hy. engr.

▲ **Tex., Orange**—Orange Co., c/o Courthouse, defeated bonds Nov. 16, road constr. $3,750,000. CD 10/29.

▲ **WASHINGTON**—State Hy. Comn., Olympia,
Yakima Co.—by-pass around Yakima, $750,000; improve Yakima River Canyon Hy. between Yakima and Ellensburg, $600,000. Work to start next year on each. W. A. Bugge, state hy. dir.

EARTHWORK, WATERWAYS

▲ **Conn., Bristol**—Farmington Valley Flood Control Comn., City Hall, flood control facilities, storage reservoirs, deepening, widening, and straightening water courses of Pequabuck River, $2,545,000. John J. Mozzochi & Assocs., 265 Hebron Ave., Glastonbury, engrs. Goodkind & O'Dea, 1214 Dixwell Ave., Hamden, consult. engrs. CD 10/3.

AIRPORTS

▲ **Ind., Indianapolis**—AIRPORT—Marion Co., airport, $1,500,000.

▲ **O., Dayton**—TERMINAL—City, Karl Woditsch, serv. dir., airport terminal at Cox Municipal Airport in center location, $6,800,000. revised est. Leigh Fisher & Assocs., 225½ Riverside Ave., South Bend, Ind. and Barber & Assocs., 322 Ontario St., Toledo, O., consult. engrs. CD 12/1/55.

▲† **Wyo., Cheyenne**—MISSILE BASE—Air Force Research & Development Command, Pentagon, Wash., D. C., missile base. $65,000,000.

PUBLIC BUILDINGS

Calif., Los Angeles—ART INSTITUTE—Bd. Supervs., Los Angeles Co., 501 Hall of Records, plans by Austin, Field & Fry, 2311 W. 3 St., Phase III, 2 story wing County Art Institute Addn. $718,700.

▲ **Calif., Moraga**—SCHOOL—Moraga School Dist., Moraga, elementary school. $1,500,000.

▲ **Calif., Oakland**—HEALTH DPT.—Alameda Co., c/o Clerk, Courthouse, County Health Dpt. Bldg., Broadway and 4th St. $1,209,000.

▲ **Calif., Santa Clara**—HIGH SCHOOL—Santa Clara Union High School Dist., 551 Jackson St., $4,500,000 bond election Feb. 4, Adrian R. Wilcox High School, Bowers Lane between Bayshore Hy. and El Camino Real. CD 7/25.

▲ **Colo., Broomfield Heights**—SCHOOL—School Dist. No. 43, 450 1st Ave., voted bonds Nov. 19. school construction. $1,250,000. CD 11/8.

▲ **Conn., New Canaan**—SCHOOL—Town, Town Hall, high school addn. $1,000,000.

▲ **Del., Claymont**—SCHOOLS, etc. Claymont Special School Dist. plans by Massena & DuPont, 704 Delaware Ave., Wilmington, Elementary School, Maple Lane, $750,000; Darley Rd. School addn., $500,000; gym addns. and other imprvs. to high school, $344,000. Ewald & Miller, 10 S. 18th St., Phila., Pa., consult. engrs. CD 8/29.

▲ **Fla., Raiford**—PENITENTIARY—Bd. Comrs., State Institutions, Terry Lee, secy., Tallahassee, plans by Smith & Gillespie, 121 E. Forsyth St., Jacksonville, penitentiary, $15,000,000. Kemp, Bunch & Jackson, 33 S. Hogan St., Jacksonville, engrs. CD 9/10.

Ill., Newton—HOSPITAL—Bd. Supervs. Jasper Co. Court House, referendum vote Dec. 28, county hospital. $750,000.

▲ **Ind., Anderson**—HOSPITAL—Anderson-Madison County Hospital Development Bd., c/o Comrs., Court House, hospital on 21 acre site, Rte. 32, west edge of Anderson. $3,000,000.

▲ **Ind., Danville**—HOSPITAL—Comrs. Hendricks Co., Courthouse, Danville, 80 bed county hospital at east end of town. $1,800,000.

▲ **Mass., Methuen**—SCHOOL—Town, Supt. Schools, 10 Didson Pl., plans by Henry C. Boles, 56 Hutchings St., Roxbury, Mass., one and 2 story Junior High School, Pleasantview St. 1,100,000. Constr. late February 1958. CD 2/25.

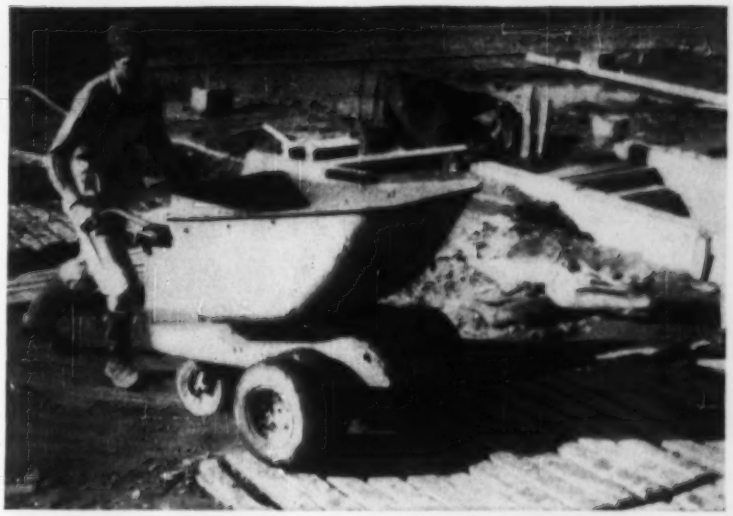
▲ **Mich., Inkster**—SCHOOL, etc.—Bd. Educ., Inkster Schools, voted bonds Nov. 18, new elementary school, and addns. to 3 schools. $1,200,000.

▲ **Mich., Lakeview**—SCHOOLS—Bd. Educ., Lakeview School Dist., Lakeview, voted bonds Nov. 5, high school, elementary school and 4 room elementary school addn., $3,650,000. CD 12/29/54.

▲ **Mich., Madison Heights**—SCHOOL—City, F. Foster Williams, supt. Schools, defeated bonds Nov. 18, High School, 11-Mile Rd. $1,500,000. George D. Mason & Co., 409 Griswold St., Detroit, Zone 26, archts. CD 10/22.

▲ **Mich., Ypsilanti**—INDUSTRIAL ART, etc.—State, Bldg. Admin. Dpt., A. N. Langius, dir., Lewis Cass Bldg., Lansing, industrial art bldg., $1,400,000; physical education bldg., $964,000; Teacher Education Bldg., $1,500,000. Eastern Michigan College. Constr. 1958-59.

(Continued on page 121).



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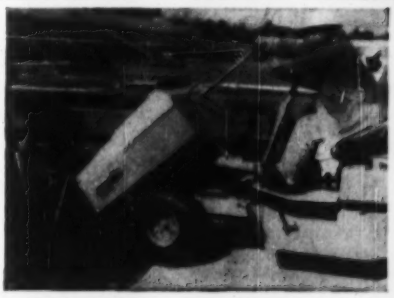

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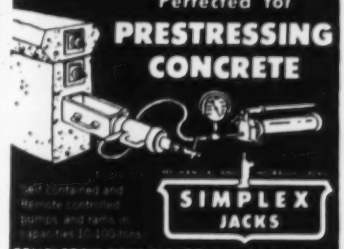

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The construction features of bridges such as this have special significance today because of the thousands of bridges and overpasses required on the National System of Interstate and Defense Highways.

Whether the bridges you design or build are long or short; straight, curved or skewed; precast, prestressed concrete construction offers many advantages. It is neat and clean. It is economical. It eliminates formwork on the job site. It speeds erection time. Weight and thickness of members are reduced.

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A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

(Continued from page 119)

▲ **Mich., Ypsilanti**—PHYSICAL SCIENCE, etc.—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Strong Physical Science Bldg. addn., $652,000; industrial service bldg., $800,000, both for Eastern Michigan College. Constr. 1958-59.

▲ **Minn., New Hope (P.O. Robbinsdale)**—SCHOOLS—Bd. Educ., Independent School Dist. No. 24, W. C. Bayard, clk., voted $3,350,000 bonds Nov. 19 for 2 schools: Junior High School in Golden Valley south of Medicine Lake Road between Douglas Dr. and St. Crois Ave., $2,000,000; elementary school (24 classrooms) west of Twin Lakes and east Hy. 52 in Crystal, $1,000,000. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, Minn., archts. CD 5/14.

▲ **Mo., Moberly**—PRISON—Missouri Bd. P. Bldgs., 100 State Capitol, Jefferson City, plans by Marcel Boulicault, 411 N. 7th St., St. Louis, Zone 1, medium security prison, $10,000,000. CD 2/6.

▲ **N. J., North Plainfield**—SCHOOL—Bd. Educ., Borough of North Plainfield, plans by Ernest G. Brown, Union Bldg., Plainfield, 3 story school addn., $822,400; elementary schools addns., alterations at East and West End. $576,600.

▲ **O., Cincinnati**—SCHOOL—Forest Hills Local School Dist., 7537 Beechmont St., defeated $1,620,000 bonds Nov. 5, school. CD 8/14.

O., Casstown—SCHOOL—Bd. Educ., Miami-East School Dist., voted $780,000 bonds Nov. 5, high school on 34 acre site south of Fletcher and 2 mi. northwest of Casstown.

O., Norwood—SCHOOL—Norwood School Dist., Williams Ave., voted bonds Nov. 5, 1 story brick school and altering present school. $750,000. Frankenberger, Junker & Lensky, 2910 Woodburn Ave., engrs.-archts. CD 8/14.

▲ **Tex., Austin**—ART AND MUSEUM—University of Texas, c/o Bd. Regents, Admin. Bldg., plans by Page, Southerland & Page, 602 West Ave., art and museum bldgs. $2,500,000.

▲ **Tex., Richardson**—SCHOOLS—Richardson Independent School Dist., Richardson, voted bonds Nov. 16, Elementary School No. 1, $750,000; Elementary School No. 2, $650,000; Elementary School No. 3, $500,000; Elementary School No. 4, $350,000; Junior High School Unit, $500,000; Senior High School Unit, $450,000. Fred Buford & Assocs., 500 Interurban Bldg., Dallas, archts. on all above projects. CD 11/6.

▲ **Wash., Olympia**—SCHOOL—School Dist. No. 1, Olympia, high school at Cloverfield site. $2,331,269.

▲ **Wis., Madison**—DORMITORY—University of Wisconsin, plans by Roger C. Kirchhoff, state archt., 3 mens dormitory bldgs. $3,600,000.

▲ **Ont., London**—HOSPITAL UNIT—Dpt. P. Wks., Hunter Bldg., Ottawa, plans by Blackwell & Hagarty, 310 Princess Ave., hospital unit at Westminster Hospital grounds. $4,000,000. M. M. Dillon & Co Ltd., 141 Maple St., consult. engrs. CD 12/12/51.

▲ **Ont., Toronto**—SCHOOLS—Toronto Bd. Educ., 155 College St., conversion of Deer Park School to a composite school, $2,021,000; transfer of McMurrich School into a composite school, $2,020,000; addn. and renovations to Oakwood Collegiate Institute, $1,605,000; Junior School in Regent Park South, incl. land and bldgs., $1,580,000; erecting new Senior School at Duke of Connaught and conversion of existing bldg. to a Junior School, $1,500,000; conversion of Winchester School into a composite school, $1,260,000.

Ont., Windsor—GARAGE—City, City Hall, Central Garage, Giles Blvd. and Mercer St. $800,000.

▲ **Que., Montreal**—BUILDING—Hydro Quebec Power Comn., 107 Craig St. W., plans by Caston Gagnier, 1449 Crescent St., Montreal, Que., 14 story Bldg., with 3 story below street level, between Dorchester, St. Catherine, Clark and St. Urbain Sts. Approx. $1,000,000. Brouillet & Carmel, 3600 Barclay Ave., consult. engrs.

COMMERCIAL BUILDINGS

▲ **Calif., Beverly Hills**—MUSEUM—Pacific Arts Museum, 10939 Chalon Rd., Bel Air, 40,000 sq. ft. Pacific Arts Museum. $1,000,000.

Calif., Stockton—LODGE—Scottish Rite Bodies Masonic Temple, Market and Sutter Sts., plans by Gifford E. Sobey, 200 San Mateo Ave., Los Gatos, 1 story, Type I constr. 40,000 sq. ft. lodge bldg., Alpine Ave., $700,000. O. T. Illerich, 56 E. Santa Clara St., San Jose, consult. engrs.

▲ **Calif., Tracy**—SHOPPING CENTER—Malloch Constr. Co., 1050-19th Ave., Oakland, shopping center, Grant Line Rd. and McKinley Ave. $3,500,000.

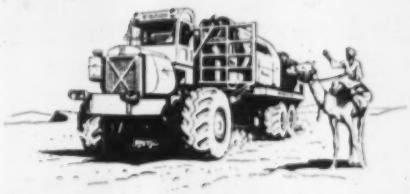
▲ **Calif., Visalia**—SHOPPING CENTER, etc.—Rowe & Uhlman, c/o Albert C. Martin & Assocs., archts., 33 Beaudry St., Los Angeles, brick walls, steel frame, mosaic tile and glass constr. shopping center, incl. 40,000 sq. ft. for department store, 19,000 sq. ft. department store, bank, medical bldg., restaurant, small shops, 2 super markets, parking area, south of West Mineral King, $3,500,000. Constr. about May.

▲ **D. C., Wash.**—HEADQUARTERS—American Association of University Women, 1634 "I" St. N.W., headquarters bldg., Potomac Plaza Center. $2,000,000.

▲ **Ill., Chicago**—INDUSTRIAL RELATIONS CENTER—University of Chicago, Midway and Woodlawn Sts., Industrial Relations Center Bldg., on campus at Kinbarck Ave. and 60th St. $1,300,000.

▲ **Ind., Indianapolis**—HOSPITAL—Methodist Hospital of Indiana, 1604 N. Capitol Ave., plans by D. A. Bohlen & Son, 930 State Life Bldg., 2 story, bsmnt., 66x199 ft. plus 37x65 ft. wing, steel frame, con-

(Continued on page 124)



Wilderness Freighters

by R. G. LeTOURNEAU

Take a look at the map of the world. Most of the land areas you see have very few highways. And the roads that they do have are usually pretty bad.

Now these areas are badly in need of development. But how can boxcar-size loads of heavy machines and supplies be moved into them to get the work started?

The ideal answer would be some way to travel right through these roadless areas, or else over the rough, hacked-out trails which are already there.

Ordinary trucks haven't got the traction, the flotation, the power, or the strength to handle this kind of job efficiently and economically — although we all know you can't beat them on the highways they were designed for.

This is a big problem—the kind it takes a big machine to answer.

Our answer is a new kind of super-powerful truck designed just for this job — and we've built them to haul loads up to 125 tons. We call them LeTourneau Transporters.

Take a medium-sized Transporter, for example. It's mounted on tires that stand 6 feet high and measure 2½ feet across, and can carry 60,000 pounds of cargo.

Like its bigger brothers, it will move its load across sand, snow, mud, through underbrush and up steep grades, to do the job an ordinary truck does on a highway.

This particular Transporter is a six-wheel vehicle, with power in all six wheels. The military would call it a 6x6. However, the similarity with other haulers ends right there.

This machine is equipped with *electric wheels*. Each one is sort of an independent power package, with its own electric motor and gear reduction built inside.

We've seen one of our electric 6x6 Transporters roll up to a vertical concrete wall three feet high and smoothly lift itself right over without any slip, fuss or muss. We've also seen it carry a 30-ton load up a 40% grade.

You can slam on the brakes without wearing them out . . . they're electric, too. With our dynamic braking, the fingers of magnetism reach through the steel and across an air gap to hold the machine back. This brake system is good for a lifetime, no matter how much you use it, because it doesn't have any parts to wear out.

Steering is easy. Just flick your finger against an electric toggle switch — left to go left, right to go right. Electric power moves the whole front end in a 160-degree swing, so you can turn the Transporter almost at right angles either way. This makes maneuvering in rough country a lot easier.

Such a machine is a good example of what the big out-door jobs take. Each type and size of job, though, has its own problems, which of course, suits us because we build the machinery to fit the job, whether it's logging, land clearing, off-shore drilling or heavy material handling in some distant wilderness. If your problem needs a solution as big as those we build for other people, we'd like to help. Let us hear from you.

R.G. LeTourneau

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Pay Of College Teachers . . . Where The Russians Are The Capitalists

This editorial deals with a simple question about college faculty salaries: Which country pays its teachers better, Russia or the United States? It's a good question, with a sadly embarrassing answer.

That American college and university teachers are underpaid is not a novel observation. But what has happened to the economic status of their profession can be put in more candid terms. **As far as financial incentives are concerned, we have virtually socialized the academic profession.** Teaching has become such a poorly paid career, with so little prospect of material reward for outstanding performance, that it simply does not attract enough highly qualified young men and women.

Ironically, the Soviet Union has deliberately and successfully used capitalist incentives to improve its educational system. Although the Russians show an utter disregard of civil liberties, they pay their teachers well and confer on them all the prestige and privileges the Soviet society can offer. Russian professors, together with party officials and scientists, have become the privileged upper class of a supposedly classless society.

Incentives To Be A Teacher

To be a college teacher requires high intellectual competence and long, sometimes costly, formal training. Aside from the appeal of academic life, what incentive does college teaching offer bright young men and women?

In the U. S., the average faculty salary is little more than the average income of industrial workers. According to the National Education Association, the average faculty salary is about $5,240. College instructors receive $4,100, associate professors $5,730 and full professors $7,100. The average income of U. S. factory workers in 1956 was $4,580.

Actually, workers in many industries — steel, automobile and petroleum, for example—earn more on the average than college teachers. And skilled workers often earn more than full professors at some of our colleges and universities.

In Russia, on the other hand, the young Soviet graduate can see that it pays — and pays very well — to choose teaching as a career. The head of a department in a Russian university can command a salary of about 6,000 rubles a month.* This is about eight times the income of the average Russian worker, who earns 750 rubles a month.

The Russian professor comes off very well in terms of what his income will buy. It has been estimated that, based on Soviet consumption patterns, 6,000 rubles a month is worth about $7,200 a year — or higher than the average professor's salary in the U. S. Of course, it is difficult to compare living standards in two countries as different as the U. S. and Russia. But particularly in the field of science — where the salaries can run to 15,000 or more rubles a month — it is clear that the Soviet professor enjoys a higher real income than that offered his American counterpart by a much more prosperous economy.

Incentives To Be A *GOOD* Teacher

Russia also offers much higher premiums than the U. S. to those who attain distinction in teaching. Teachers at the university level earn significantly more than teachers in high schools, and university instructors can look forward to a sharply progressive rise in earning power as they

* *Soviet Education for Science and Technology* by Alexander Korol of the M.I.T. Center for International Studies.

How Faculty Salaries Compare With Industrial Wages

(Worker's Wage In Each Country = 100)

*Sources: Center for International Studies, M.I.T.; National Education Association; McGraw-Hill Department of Economics

advance to higher positions. The spread between the income of a full professor and the lowest academic position is greater than fifteen to one. In addition, full professors can earn a healthy bonus if they are elected to membership in the Russian Academy of Sciences.

In the U. S., by contrast, full professors on the average earn less than twice as much as beginning instructors. And many college professors earn less than public school teachers in large cities. Even a full professor's pay does not compare with earnings in other professions or in positions in industry requiring similar training. The point was well summarized in a recent speech by Marion B. Folsom, Secretary of Health, Education and Welfare: "It is nothing short of a national disgrace that we are discouraging people who want to teach by offering salaries that are far below the levels justified by their training and far below the levels which others are willing to pay."

Our colleges and universities, as well as our teachers, find themselves in a serious predicament. Faced with a shortage of both funds and teachers, they cannot reward distinguished performances. Limited resources for salary increases have gone predominantly to the lower ranks, so that an adequate number of teachers could be retained. Meanwhile, potentially fine teachers are being siphoned off into better paid occupations.

The shabby treatment of our teachers threatens to undermine, not only our educational standards, but our free enterprise system itself. There is the recent example of a liberal arts college which discovered that five of its graduating seniors were being offered starting salaries higher than those paid any of their professors. It would be surprising if experiences like this did not place a strain on the enthusiasm with which these professors deal with some key aspects of American capitalism.

Also important is the role education is playing in the cold war with the Soviet Union. The Russians have made great strides in raising the quality of their education — particularly in science and engineering. Both the number and the technical calibre of their graduates are impressive, as recent Soviet achievements testify. These successes owe much to the generous economic treatment the Russians have given their teaching profession.

A Standard For Faculty Pay

Earlier editorials in this series have outlined various ways American business can help relieve the financial plight of our colleges and universities. They have suggested that private contributions to higher education should average at least $400 million a year over the next ten years if faculty salaries are to be raised to adequate levels and our colleges are to be able to meet increasing operating costs.

Another standard for raising faculty salaries proposed by an American businessman is this: "When a teacher's income gets up to a point where you will suggest to your boy that he ought to give some thought to teaching as a profession, then we may be approaching the right figure."

Russia clearly has set her teaching salaries well above the "right" figure. We are nowhere near it. What this adds up to is that the Communists — not we — have become the shrewd capitalists in the vital field of education.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

(Continued from page 121)

crete, masonry exterior psychiatric hospital adjoining present hospital, $1,000,000. Ammerman Davis & Stout, 912 K of P Bldg., mech. consult. engrs.

▲ **Ind., Schererville**—SEMINARY—Capuchin Order of Franciscan Missionaries, 1740 Mount Elliott Ave., Detroit, Mich., plans by Charles D. Hannan, 32580 Grand River, Farmington, Mich., 2 story, bsmnt., brick seminary, $2,000,000.

▲ **Mich., Southfield**—SYNAGOGUE—Congregation Shaarey Zedek, 2900 West Chicago St., Detroit, synagogue, 11-Mile Rd. and Northwestern. $3,500,000. Fund raising program started.

▲ **Minn., Fridley**—SHOPPING CENTER—Benson Investment Co., 1929 Nicollet Ave., Minneapolis, shopping center, incl. 25 shops, Central Ave. N. E. and Hy. 100, $5,000,000. Constr. late 1959-60.

▲ **N. J., Trenton**—APARTMENTS—Harry Leibowitz & Joseph Mascoli, 161-16 Jamaica Ave., Jamaica, N. Y., plans by Mardan Assocs., consult. engrs.-archt. 5 Beekman St., New York, N. Y., two 13 story apartments and one 4 story office bldg., 333 West State St. on site of old Carteret Club. $2,000,000. Expect to start in February or March, 1958.

▲ **N. J., Trenton**—DORMITORIES—Rider College, 428 E. State St., 1 women's and 1 men's dormitories. $1,100,000. CD 9/26/56.

▲ **N. J., Union**—Y.M.H.A. AND Y.W.H.A. BLDG.—Y.M. & Y.W.H.A., 1034 East Jersey St., Elizabeth, plans by Levy & Scheingarten, 1120 E. Jersey St., Elizabeth, Y.M. and Y.W.H.A. Bldg., Greene Lane. $1,000,000.

▲ **N. Y., Buffalo**—CHARLES BUILDING—Owner, c/o Lawrence A. Wien, 60 E. 42 St., New York, 60,000 sq. ft., Charles Bldg. addn., Court St. $1,000,000-$2,000,000. Construction in about 3 years.

N. Y., New York—APARTMENT—179 E. 70 St. Co., 111 E. 38 St., New York, Zone 16, plans by Korkins & Lyras, 660 Madison Ave., Zone 21, apartment, 179-81 E. 70 St. $993,489.

▲ **O., Cincinnati**—HOSPITAL—Rollman Receiving Hospital, Burnet, Cincinnati, O. and State, plans by Hake & Hake, 2400 Gilbert Ave., hospital, $1,200,000.

▲ **Okla., Tulsa**—HOUSING—Chandler-Frates Co., 621 South Main St., plans by D. L. Cotner, 2240 South Marion St., 100 homes negro housing addn. in the Roberts addn. to Tulsa. $1,000,000.

R. I., Warwick—SCHOOL—Rev. Russell J. McVinney, DD, Bishop of Providence; Chancery Office, Fenner St., plans by Charles A. Maguire & Assoc., Turks Head Bldg., Providence, Boy's Catholic High School between West Shore Rd. and Harwich Ave. $700,000. CD 6/13.

▲ **Tenn., Memphis**—ACADEMY—Harding College, Searcy, Ark., plans by Sanford & Ellis, Falls Bldg., constr. Harding Academy, a church of Christ group, incl. classrooms, laboratories, aduitorium, gymnasium, cafeteria and playgrounds. $1,250,000.

Tenn., Nashville—SHOPPING CENTER—Glazer Steel Co., 2100 Ai Lor Ave. N.W., Knoxville, shopping center 12th Ave. S., consisting supermarket, shoe store, hardware store, ready-to-wear shop, off-street parking, $750,000-$1,000,000.

Tex., Houston—CHURCH—Gethsemane Church, c/o MacKie & Kamrath, archts., 2713 Ferndale St., church. $750,000.

Tex., San Antonio—DORMITORY, etc.—Our Lady of Lake College, 24th and Durango St., plans by Phelps & Dewees & Simmons, 342 W. Woodlawn St., womens dormitory dining hall and infirmary. $763,000. CD 2/8.

▲ **Tex., Victoria**—POSTOFFICE, etc.—General Services Admin., General Services Bldg., Wash 25, D. C. and Fed. Records Center, 424 W. Vickery, Fort Worth, postoffice-courthouse. $1,563,000. Lease purchase project.

▲ **Wash., Seattle**—CLUB—Scottish Rite Temple, Inc., 1115 Broadway, Zone 2, club bldg., $1,000,000.

▲ **Wash., Spokane**—RETIREMENT HOME—Presbyterian Retirement Homes, c/o A. Arend, W. 710 Main St., plans by Eddy, Carlson & James, N. 1205 Washington St., Spokane, Wash., retirement home. $1,000,000. Work to start next spring. CD 5/14.

▲ **W. Va., Huntington**—SHOP CENTER—Stanley Evans, c/o Evans Grocery Co., Gallipolis, O., shop center on 14 acre site on U. S. Route 60 east of Huntington, $1,000,000.

▲ **Alta., Edmonton**—HOTEL—Project Sponsors, E. J. Carline & Assocs., Edmonton, 5 story hotel to contain 200 rooms with parking space for 550 cars and a heliport, $5,000,000. Constr. probably next spring.

▲ **Que., Montreal**—OFFICE DEVELOPMENT—Webb & Knapp (Canada) Ltd., 1010 St. Catherine St. W., plans by Raymond Affleck, Guy Desbarats, Dimitri Dimakopoulos, Fred Lebensold, Jean Michaud and Hazen Sise, this partnership to be known as ARCOP, c/o R. Affleck, 5060 Western Ave., constr. Villa Marie Plaza Development, 40 story, steel and glass office structure to rise 500 ft. in shape of a cross and plaza sub-surface parking constitute first phase of proj. $75,000,000-$100,000,000 Brett-Ouellett-Blauer Assocs., 4255 Sherbrooke St. W., structural engrs. James P. Keith & Assocs., 4935 Clanranald Ave., mechanical engrs. CD 9/5.

INDUSTRIAL BUILDINGS

▲ **Ark., Magnolia**—PLANT—Arkansas Louisiana Gas Co., 300 W. Capitol St., Little Rock, petrochemical plant. $3,000,000.

▲ **Ind., Lafayette**—PLANT—Purdue University, Lafayette, power plant, Grant Ave. $10,000,000.

▲ **Iowa, Spencer**—PLANT—Corn Belt Power Cooperative, Humboldt, steam generating plant. $5,500,000. Stanley Eng. Co., Muscatine, consult. engrs.

▲ **Mo., St. Louis**—ADMINISTRATION—Chrysler Corp., 344 Mass. Ave., Detroit, Mich., plans by Sverdrup & Parcel, archts.-engrs., 1134 Locust, St. Louis, Mo., administration building. $1,000,000. CD 10/16.

▲ **Okla., Cushing**—REFINERY—Kerr-McGee Oil Industries, Inc., Cushing increasing existing capcity crude refinery by about 8,000 bbls. daily, $1,000,000.

▲ **Okla., Drumright**—REFINERY—Kerr-McGee Oil Industries, Inc., Drumright, enlarging crude unit refinery by about 7,000 bbls. daily. $1,000,000. Litwin Eng. Co., Central Bldg., Wichita, Kan., consult. engr.

▲ **Tex., Galena Park**—PLANT—U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill., Hdqrs., and Galena Park, Tex., plant to mfg. gypsum wallboard, rock lath, plaster, gypsum sheathing. $5,000,000. (Correction—cost). CD 10/25.

▲ **W. Va., Applegrove**—PLANT—Appalachian Electric Power Co., 40 Franklin Rd., Roanoke, Va., steam electric generating plant.

▲ **Puerto Rico, Ponce**—REFINERY EXPANSION—Commonwealth Oil Refining Co., Inc., Ponce, Puerto Rico, refinery expansion, incl. visbreaker and catalytic hydrogen treating unit. $2,000,000.

UNCLASSIFIED

▲ **Kentucky**—RURAL DISTRIBUTION LINES—Meade County Rural Electric Co-operative Corp., Brandenburg, 218 mi. electric distr. line; 13 mi. 69 KV transmission line and sys. imprvs., Meade Co. $1,065,000. CD 1/12/50.

▲ **La., Baton Rouge**—BARGE TERMINAL—Greater Baton Port Comm., 141 N. Jefferson, Port Allen, barge terminal. $4,000,000. Barnards & Burk, 1023 Nicholson Dr., engrs.

▲ **Minnesota**—RURAL DISTRIBUTION LINES—People's Co-operative Power Assn., Rochester, 30 mi. electric distr. line; 27 mi. 69 KV transmission line and sys. imprvs., Olmsted Co. $1,186,000. CD 10/1/54.

▲ **N. J., Port Newark**—AIR CARGO STORAGE BLDGS.—Port of New York Auth., 111 8th Ave., New York 11, N. Y., plans by B. Spencer Newman, 173 Main St., Hackensack, 4 one story air cargo storage bldgs. on 29 acre tract near Brewster Hangar, $4,000,000. To be ready by Summer of 1959. CD 3/21.

▲ **Texas**—PARK—State Park Bd., c/o Norefleet G. Bore, landscape archt. and div. supt., c/o State Admin. Bldg., Austin, development of "Eisenhauer" State Park on Lake Texoma, Denison, $1,000,000. CD 7/24/53.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

December 17 Massachusetts

BUILDINGS—BA

Mass., Chicopee—SCHOOL—BA 12/20—City, c/o School Dpt., John L. Fitzpatrick, supt., 135 Grape St., Hugh Scott Streiber Memorial Elementary School, off Telegraph Ave. $750,000. Plans deposit $25. CD 11/13.

HEAVY CONSTRUCTION—LB & CA

CONNECTICUT—State Hy. Comn., State Office Bldg., Hartford. Bids opened 12/2.

Oneglia & Gervasini, Inc., Casson Ave., Torrington, Conn., LB $548,487 (10 bidders), Proj. 91-72-3 span bridge over Farming River and approx. 4,174 lin. ft. c. conc. Route U. S. 44, F.A.P. ER-11, Canton and New Hartford. CD 11/13.

Vanguard Constr. Corp., 369 Lexington Ave., New York, N. Y., CA $514,804, Contr. No. 1, sewage treatment facilities and misc. appurtenances, WILLIMANTIC, CONN. City of Willimantic, Conn. Bids Oct. 28, awarded Nov. 27. CD 11/4, under LB.

BUILDINGS—LB & CA

▲ Vappi & Co., Inc., 240 N. Sidney St., Cambridge, Mass., LB $2,309,860, Proj. No. Mass. 19-CH-6 (D) WOMEN'S RESIDENCE HALL, Bay State Rd., BOSTON, MASS. Boston University, Bd. Trustees, c/o business mgr., 755 Commonwealth Ave., Boston, Mass. Bids Nov. 5. CD 10/23.

M. Spinelli & Sons, Inc., 25 Moulton St., Cambridge, Mass., LB $555,000, HOUSING for the Elderly, State Aid, Proj. No. 667-2, WALTHAM, MASS. Waltham Housing Authority, 5 Brookway Rd., Waltham, Mass. Bids Nov. 29. CD 11/13.

J. W. Bishop Co., 109 Foster St., Worcester, Mass., LB $748,290, Contract P-57-4, Multi Deck Parking GARAGE, between Pearl and Elm Sts., WORCESTER, MASS. City, Off Street Parking Bd., c/o Office City Manager, Worcester, Mass. Bids Nov. 27. CD 11/8.

▲ Nils Johnson, Inc., 1025 Warwick Ave., Edgewood, R. I., CA $1,255,051, campus type JUNIOR-SENIOR HIGH SCHOOL, north side of 40 acre Annaquatucket Farms, NORTH KINGSTON, R. I. Town, School Bldg. Comn., Town Hall, Wickford, R. I. Bids Nov. 5. CD 11/11, under LB.

▲ Bregman Constr. Co., 250 E. 42nd St., New York 17, N. Y., CA $2,147,320, two 2 story cellblock units at STATE PRISON, ENFIELD, CONN. Connecticut State Prison, Wethersfield, Conn. Bids Nov. 13. CD 7/30.

Fabrizio & Martin, Inc., McLaren Rd., Darien, Conn., LB $879,500 LB (14 bidders) Proj. B1-D-2006, FINE ARTS CENTER, University of Conn., STORRS, CONN. State P. Wks., Comr., 165 Capitol Ave., Hartford, Conn. Bids Nov. 27. CD 10/30.

▲ I. R. Stich Assocs., Inc., 611 New Park Ave. West Hartford, Conn., Owner Builds, $1,120,000, 70 HOUSES "Simsbury Heights", TARRIFFVILLE, CONN. Elroy Weber, 57 Pearl St., Springfield, Mass., archt. Francis P. Molloy, 10 N. Main St., West Hartford, Conn., engr. CD 3/9/56.

W. J. Quinn Co., 16 Edson St., Longmeadow, Mass.-CA $500,000, 16 room ELEMENTARY PAROCHIAL SCHOOL, Pearl St., Exten., THOMPSONVILLE, CONN. St. Patrick's Parish, 64 Pearl St., Thompsonville, Conn. CD 4/26.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

December 19 New Jersey December 20 Pennsylvania

January 7 Maryland

Pa., Baden—BA 12/21—Borough of Baden Municipal Auth., sewage treatment proj., incl. interceptor treatment, plumbing, heating, and electrical. $533,000. Plans deposit $110. Gannett, Fleming, Corddry & Carpenter, Inc., 119 Shady Ave., Pittsburgh, engr. CD 8/26.

▲ N. J., Somerville—BA 1/15—Somerset-Raritan Sewer Auth., Somerville, constr. primary sewage treatment plant and collection sys. $3,000,000-$4,000,000. Whitman, Requardt & Assocs., 1304 St. Paul St., Baltimore, Md., engrs. CD 1/25.

BUILDINGS—BA

▲ Md., Baltimore—SCHOOL—BA 12/11—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, 2 story, 40 classroom, brick, concrete, steel, block, Edgewood Elementary School, Edgewood St. and Walbrook Ave., $1,100,000. Plans deposit $50. Stevenson & Wing, 925 N. Charles St. Zone 1, archts. CD 5/23/56.

Pa., Williamsport—CONVENT, etc.—BA 12/19—Divine Providence Hospital, 1100 Grampian Blvd., convent and chapel addns. $750,000. Extended date. George E. Yundt, 126 S. 6th St., Allentown, archt. CD 11/21.

▲ N. J., Camden—SCHOOL—BA 1/9—Bd. Educ., City Hall, Zone 1, Woodrow Wilson High School addns., alterations, incl. gymnasium and classrooms; Camden Senior High School addns., alterations. $3,000,000. Plans deposit $50. Bellante & Clauss, 1810 Rittenhouse Sq., Phila., Pa., archts. CD 5/22.

▲ N. J., Clark—SCHOOL—BA 1/21—Union County Regional High School System, Felmer Ave., Springfield, Constr. Clark Regional High School addn. $1,500,000. Target for completion Sept. 1959. Frederick Elsasser, 2013 Morris Ave., Union, archt. CD 11/27/56.

▲ N. J., Berkeley Heights—SCHOOL—BA 3/4—Union County Regional High School System, Felmer Ave., Springfield, regional high school, $2,500,000. Frederick Elsasser, 2013 Morris Ave., Union, archt. CD 11/28/56.

HEAVY CONSTRUCTION—LB & CA

Buesching Bros. Constr. Co., 219½ E. Berry St., Fort Wayne, Ind., CA $809,259, filtration plant expansion on Tonawanda Island in Niagara River, NORTH TONAWANDA, N. Y. City, City Hall, North Tonawanda, N. Y.

Depew Paving Co. Inc., 6100 Transit Rd., Depew, N. Y., CA $755,545, storm sewers in Northeast section of NORTH TONAWANDA, N. Y. City, City Hall, North Tonawanda, N. Y.

▲ MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Williams Constr. Co., Middle River, Md., CA $1,909,259 grading, drainage, surf. 1.884 mi. Baltimore-Harrisburg Expressway, also dual 5 span bridges over P.R.R. Little Falls Creek, Contract B-578-32-420, Baltimore Co. Bids Nov. 5. CD 11/7, under LB.

Donaldson Paving Co., Inc., 20 Potomac Ave. S.W., Wash., D. C., LB $799,787 (Base Bid) Fed. Aid Proj. No. U-49 (2), grading, paving roadways Military Rd. and Missouri Ave. N.W., 13th to 27th Sts., WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids Dec 3. CD 11/18.

BUILDINGS—SLC

▲ East Hill Estates, c/o Herman York, archt., 90-04 161 St., Jamaica, N. Y. Owner Builds. $1,000,000, 65 HOMES, Wicks Rd., BABYLON, N. Y.

▲ Harbour Park Estates, c/o Strathmore Agency, 665 E. Jericho Turnpike, Huntington Station, N. Y. Owner Builds. $1,250,000, 50 HOMES, Little Neck Rd. and Mallard Ave., CENTERPORT, N. Y.

▲ Lasker & Goodman Corp., 50 E. 42nd St., New York 17, N. Y., CA $6,921,000, FERRIS BOOTH HALL, CITIZENSHIP CENTER and UNDERGRADUATE DORMITORY, NEW YORK, N. Y. Columbia University, 116 St. and Broadway, New York, N. Y. CD 11/29, under LB.

▲ Oakdale Park River Estate, c/o Alwyn Cassens, archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. $1,000,000, 50 HOMES and SHOPPING CENTER, Montauk Hy., OAKDALE, N. Y.

Beechwood Village, c/o Henry A. Klar Realty Co., 165 Hempstead Turnpike, West Hempstead, N. Y. Owner Builds. $500,000 (3rd section) 50 HOMES, Jericho Turnpike, east of Smithtown, SELDEN, N. Y.

Glen Crest Estates, c/o. Isadore Naftali, archt., 312 High St., Newark, N. J. Owner Builds. $544,000, 32 HOMES, Route 202 at Whiton Rd. in Somerset Hills area, BRANCHBURG TWP. (NEW BRUNSWICK), N. J.

▲ Glenwal, Inc., U. S. Hy. 46, Saddle Brook, N. J., CA $1,477,150, general contract HIGH SCHOOL BLDG., EAST BRUNSWICK (OLD BRIDGE, P. O.), N. J., Bd. Educ., Twp. of East Brunswick, 13 Elaine Rd., Old Bridge, N. J. CD 6/7/56.

Hillsdale Manor, c/o Rudolph Novak, archt., 713 Main Ave., Clifton, N. J. Owner Builds. $616,000, 28 HOMES, Hillsdale Ave. and Bedford Rd., HILLSDALE, N. J.

Sayville Country Estates, c/o Edelson Realty Co., 109 W. Main St., East Islip, N. Y. Owner Builds. $450,000, 50 HOMES, Montauk Hy., ½ mi. east of Locust Ave., WEST SAYVILLE, N. Y.

McCabe Builders, 1218 Chestnut St., Phila., Pa. Separate Contracts. $570,000, 64 unit RESIDENTIAL DEVELOPMENT, Hermitage St., PHILA., PA.

Mellon Stuart Co., 210 East Park Way, Pittsburgh, Pa., CA $750,000, 2 story, 15,000 sq. ft. floor space, PRODUCTS AND PROCESS BLDG., Springdale, PITTSBURGH, PA. Pittsburgh Plate Glass Co., Gateway Center, Pittsburgh, Pa. Bids Oct. 3, awarded Nov. 19. CD 9/30.

Ken Flower, Southampton, Pa. Separate Contracts. $525,000, 35 unit RESIDENTIAL DEVELOPMENT, Edgehill Rd., etc., WILLOW GROVE, PA.

▲ W. H. Ward Contractors, 323 E. 25th St., Baltimore 18, Md., LB $1,125,000, est. $1,000,000 (13 bidders) 1 and 3 story, brick, concrete, steel, block Barclay Elementary SCHOOL, Barclay and 29 Sts., BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids Nov. 27. CD 11/18.

▲ Jeffres-Dyer, Inc., 908 20th St. N.W., Wash., D. C., CA $1,400,000, 4 story, 55x167 ft. masonry, steel OFFICE BUILDING, 11-25 W. Saratoga St., BALTIMORE, MD. Loch Raven Properties, Inc., 11-25 W. Saratoga St., Baltimore 1, Md.

John Tester & Son, Clinton, Md., CA Est. $700,000 Country Day SCHOOL, BETHESDA, MD. Stone Ridge Convent of Sacred Heart, 9101 Rockville Pike, Bethesda, Md. Bids Nov. 7, awarded Nov. 26. CD 11/20, under LB.

▲ Owner, c/o Group of Labor Unions, c/o George Stone, archt., Wire Bldg., Wash., D. C. Owner Builds. $10,000,000, constr. 1,000 HOMES, BLADENSBURG, MD.

▲ Fairmount Bldg. Co., 604 Goucher Bldg., Towson 4, Md., Owner Builds, $2,900,000, steel, masonry, concrete, block, air-conditioned SHOPPING CENTER, Dulaney Valley Rd. and Fairmount Ave., TOWSON, MD.

† Gunnell Constr. Co., Tower Bldg., Wash., D. C., LB $998,000 (Base Bid) (6 bidders) GARAGE in courtyard of existing Old House-Office Bldg. of U. S. House of Representatives, WASH., D. C. U. S. Govt., Office of Architect of the Capitol, U. S. Capitol, Wash., D. C. Bids Dec. 4. CD 10/31.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

December 18 Virginia

STREETS AND ROADS

December 18 Virginia

BUILDINGS—BA

Ky., Winchester—HOUSING—BA 12/19—City, City Hall, Ky. 18-3-4, municipal housing, 54 units, 2 story, 17x110 ft., concrete slab floor, brick, 1-4 bedrooms. Approx. $500,000. James, Allen, Clark, Brown, Proctor Heights, Winchester, archts. James Wash, 137 E. High St., Lexington, assoc. archt. CD 9/17/56.

▲† S. C., Parris Island—FAMILY HOUSING—BA 1/22—Dist. P. Wks. Office, Bldg. No. 13, Naval Base, Charleston, 355 single unit dwellings, Capehart Family housing, incl. clearing, grubbing, road and street sys., water distr. sys., sanitary sewerage sys., storm drainage, electrical distr., telephone distr. and landscaping at Marine Corp Recruit Depot, NBy (CH)-13909. Plans deposit $50 per set, incl. reduced size lithograph prints, or $150 per set, incl. full size prints. Extended date. CD 10/14.

HEAVY CONSTRUCTION—LB & CA

▲ SOUTH CAROLINA—State Hy. Dpt., C. R. McMillan, ch. hy. comr., Hotel Jefferson, Columbia, Bids opened Nov. 26,

S. C.—Cherokee, Inc., Sumter Hy., Columbia, S. C., LB $154,735 (2 bidders) widen with b. conc. surf. and concrete curb and gutter, 1.037 mi. US Rte. 76, S. C. Docket No. 40,472, F.A. Proj. No. U-2608 (1) Richland Co., LB $355,643 (2 bidders) grading, asph. concrete surf. and constr. concrete curb and gutter and concrete sidewalk in widening of 2.878 mi. on Rte. 12 (Forest Drive) and connections from Pinehurst S., to Trenholm Rd. in and near Columbia S. C. Docket No. 401453, F.A. Proj. No. US 2592 (2), Richland Co.;

S. C.—Santee Constr. Co., Inc., Walterboro, S. C., LB $200,689 (5 bidders) bit. surf. 20.105 mi. roads 83, 42, 62, 245, 101, 102, 111, 123, 241, 80 and Rte. 362 S. C. Docket Nos. 15.319 and 15.320 F.A. Proj. Nos. S-1060 (1) S-1060 (2) S-1137 (1) & S-1138 (1) Colleton Co.; LB $158,706 (3 bidders) bit. surf. 11.359 mi. on Roads 80, 713 thru 733, 735 thru 737, 739 thru 743, 745 thru 764 and 620 being streets adjacent to city of Charleston west of the Ashley River and streets at Folly Beach, S. C. Docket No. 10.446, Charleston Co.;

S. C.—Davis Moragne, 301 Gadsden St., Columbia, S. C., LB $128,794 (6 bidders) bit. surf. 13.981 mi. Roads S-56, S-74, S-191, S-190, S-192, S-11, S-61, S-154, S-186, S-206, S-207, S-209 thru S-212, S-81, S-123, S-27, S-143 and S-296, S. C. Dockets Nos. 3.301 and 3.302 F.A. Projs. Nos. S-286 (2), S-1135 (1) & S-1136 (1) Allendale Co.; LB $90,480 (9 bidders) bit. surf. 9.155 mi. Roads S-127, S-128, S-63, S-123, S-68, S-192, S-193 and S-195 S. C. Dockets Nos. 14.334 & 14.335 F.A. Projs. Nos. S-973 (2) S-115 (1) S-116 (1) & S-117 (1), Clarendon Co.;

S. C.—Robert E. Lee & Co., Inc., Manning, S. C. and Fox Constr. Co., Inc., Lexington, S. C., LB $2,069,842 (11 bidders) b. conc. surf. for constr. 4 lane divided hy. on U.S. Rte. 276 from Fountain Inn to US Rte. 221, 12.698 mi. S.C. Docket No. 30.365 F.A. Proj. Nos. F-84 (8) & F-2611 (1) Laurens Co.;

S. C.—Carolina Contg. Co., Inc., 1042 Adeline Dr., Columbia, S. C., LB $91,725 (8 bidders) bit. surf. 7.915 mi. Roads S-30, S-60, S-102, S-189, S-104, S-194 & S-195 S.C. Dockets Nos. 24.323 & 24.324 F.A. Proj. Nos. S-644 (2) & S-1000 (2) Greenwood Co.;

S. C.—Theo Bros., Woodruff, S. C., LB $286,760 (7 bidders) bit. surf. 1.351 mi. for 4 lane divided hy. 1.351 mi. on US Rte. 29 from Road 5 near Gantt toward Greenville, S.C. Docket No. 23.405 F.A. Proj. No. IN-310-1 (1) Greenville Co.;

S. C.—Robert E. Goodson, Darlington, S. C. LB $157,015 (9 bidders) bit. surf. 16.138 mi. Roads S-106, S-537 & S-34 S. C. Docket No. 21.422, F.A. Proj. Nos. S-931 (2) S-1140 (1) & S-1141 (1) Florence Co.;

S. C.—J. F. Cleckley & Co., Orangeburg, S. C. LB $102,955 (6 bidders) bit. surf. 9.754 mi. Roads S-72, S-276, S-277 & S-278 S. C. Docket No. 17.319 F.A. Proj. Nos. S-424 (4) S-276 (2) & S-1139 (1) Dillon Co.;

S. C.—Burns & Spangler Grading Contractors, Shelby, N. C. LB $223,012 (17 bidders) grading, drainage addnl. lane for divided hy. on US Rte. 29 from Rte. 198 to N. C. State Line 3.388 mi. S. C. Docket No.

(Continued on page 128)

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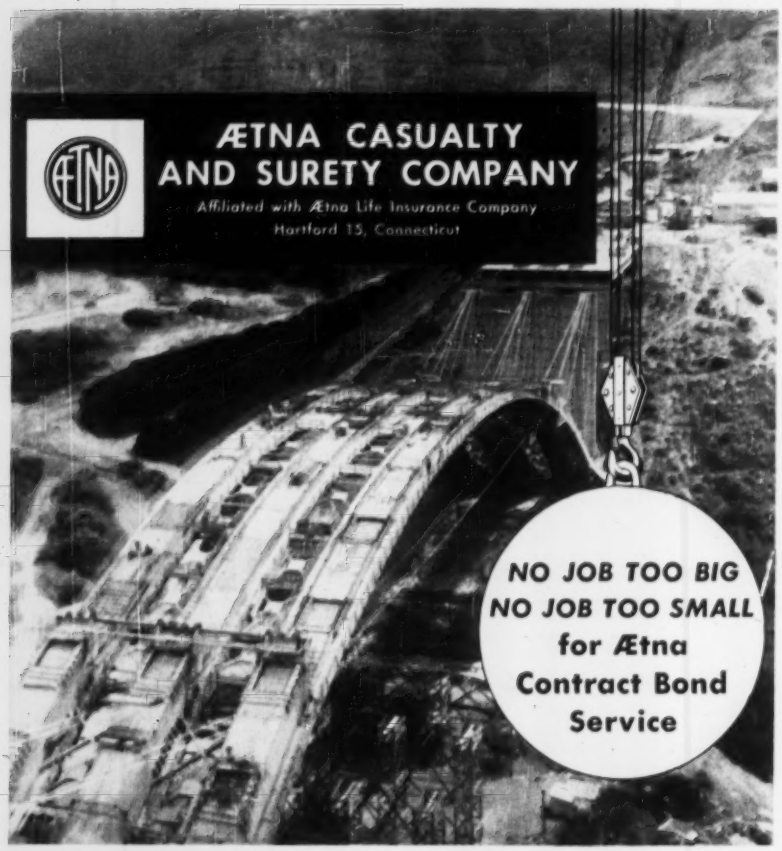

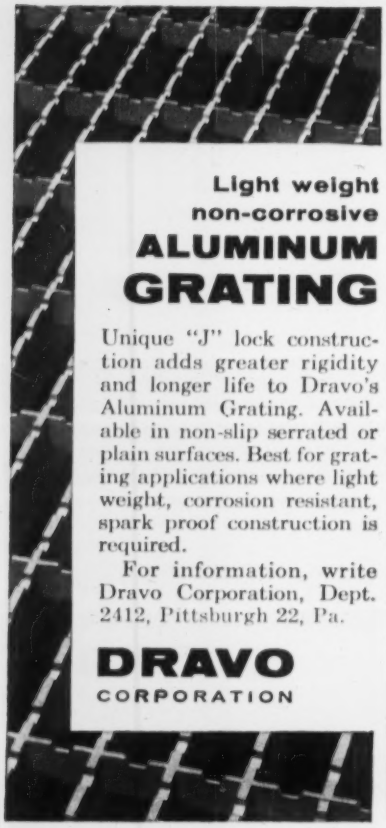
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(Continued from page 126)

11.352, F.A. Proj. No. I-301-2 (1) F & I, Cherokee Co.;

S. C.—**Ed. L. Smith**, Rte. 3, Box 1094, Columbia, S. C. LB $76,180 (4 bidders) grading, drainage 0.546 mi. Rte. 76 and connection S. C. Docket No. 40.471 F. A. Proj. I-340-1 (2) FAI Richland Co.;

S. C.—**Eugene C. Myers**, Monroe, N. C. LB $112,078 (6 bidders) bit. surf. 10.72 mi. Roads S-169, S-558, S-559, S-380 & S-560, S. C. Docket No. 46.435 F. A. Proj. Nos. S-1145 (1), S-1146 (1), S-1147 (1) and S-1148 (1) York Co. CD 11/13.

Atlantic Constr Co., 5 Baltimore Place N. W. Atlanta, Ga., LB $833,600 banana handling dock, CHARLESTON, S. C. S. C. State Ports Auth., 1 Vendue Range, Charleston, S. C. Bids Dec. 3. CD 10/30.

Salmons Dredging Co., Box 676, Charleston, S. C. LB $698,228, BULK cargo terminal and railroad trestle, CHARLESTON, S. C. S. C. State Ports Auth., 1 Vendue Range, Charleston, S. C. Bids Dec. 3. CD 10/30.

▲ **Arthur Pew Constr. Co.**, Box 8, Northside Station, Atlanta, Ga. CA $3,079,948, Contr. 1, water treatment plant, ATLANTA, GA. Ernest J. Brewer, city purch. agt. City Hall, Atlanta 3, Ga. Bids Oct. 28, awarded Nov. 26. CD 11/7, under LB.,

Burford, Hall & Smith, Box 1399, Atlanta, Ga. CA $1,759,613, Contrs. 2 and 3, water treatment plant (Atlanta, Ga.).

▲ MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,

Miss.—**LaCoste, Inc.**, Mathiston, Miss., CA $774,544, est. $850,000 grade, drain, culverts, box bridges, 2 bridges, double base surf. treat. 15.498 mi. Miss. Hy. No. 613 between Coll Town and Lucedale, Proj. F-031-1(1), Jackson Co.;

Miss.—**R. G. Brown, Jr. & Co.**, Louisville, Miss., CA $2,360,146, est. $3,000,000 grading, draining, culverts, bridges and grade separation structures 5.318 mi. US Hy. No. 11 between Ellisville and Laurel, Proj. I-16-092-2(5), Jones Co.;

Miss.—**M & W Constr. Co.**, Tupelo, Miss., CA $1,832,024, est. $2,250,000, grading, draining, culverts, bridges and grade separation structures 5.492 mi. US Hy. No. 51 between Batesville and Sardis, Proj. I-091-4 (10), Panola Co.;

Miss.—**Raley Contg. Co., Inc.**, Aberdeen, Miss., CA $146,955, est. $205,000, grading, draining, culverts 2.273 mi. Hy. No. 13 between Mendenhall and Puckett, Proj. F-037-1(5), Simpson Co. Grand total $5,113,668. Bids Nov. 26. CD 11/13.

▲ LOUISIANA—State Dpt. Hys., R. B. Richardson, dir., Hy. Office Bldg., Baton Rouge. Bids opened 11/27,

La.—**Barber Brothers Co.**, 2636 Dougherty Dr., Baton Rouge, La., LB $137,173, aggreg. type or soil cement base course, bit. surf. treatment and other related work, 2.833 mi. O'Neal Lane Hy., SP No. 713-03-63, East Baton Rouge Parish; LB $390,376, aggreg. type or soil cement base course, bit. surf. treatment and related work 9.04 mi. Raymond-Elton Hy., Rte. LA 395, SP No. 827-21-02, Jefferson Davis Parish;

La.—**T. L. James & Co., Inc.**, Ruston, La., LB $119,426, soil cement or aggreg. type base course, bit. surf. treatment and related work 2.769 mi. Lewisburg-Pitreville Hy. Rte. LA 358, SP No. 849-18-04, St. Landry Parish; LB $336,290, aggreg. type base course, bit. surf. treatment and related work 10.15 mi. Holly Beach-Cameron Hy., Rtes. La 27 and 82, SP No. 31-01-17, FAP No. ER 022 (1), Cameron Parish; LB $449,468, shaping roadway, aggreg. type base course, bit. surf. treat. and other related work 13.6 mi. Cameron-Creole Hy. Rtes. LA 27 and 82, SP No. 193-01-09, FAP No. ER-23 (1) FASP No. S-72 (3), Cameron Parish;

La.—**O. J. Ward, Inc.**, 4768 Tulsa St., Shreveport, La., LB $165,963, c. conc. pavt. and related work 0.863 mi. Dow Chemical Access Rd., SP No. 737-00-90, Iberville Parish;

La.—**F. Miller & Sons, Inc.**, P.O. Box 921, Lake Charles, La., LB $107,276, c. conc. pavt., bit. hot mix overlay and other related work 0.391 mi. Westlake St., Rte. LA 379, SP No. 810-14-11, Calcasieu Parish;

La.—**Atlas Constr. Co.**, Vidalia, La., LB $206,275, aggreg. type or soil cement base course, bit. surf. treatment and related work 5.7 mi. Lonepine-Bunkie Hy. SP Nos. 820-39-05 and 805-18-05, Evangeline and Avoyelles Parishes;

La.—**Cobb & Gray**, Box 86, Ringgold, La., LB $218,549, soil cement or aggreg. type base course, bit. surf. treatment and related work 7.08 mi. Texas State Line-Keatchie Hy., SP No. 98-01-03, DeSoto Parish;

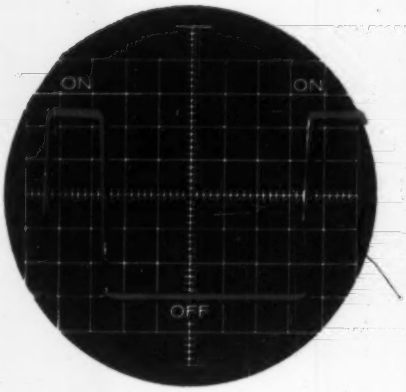
La.—**G. E. Steed, Contractor**, Box 698, Springhill, La., LB $123,322, aggreg. type or soil cement base course, bit. surf. treatment and related work 4.95 mi. Summerville-Nickel Hy., Rte. LA 503, SP No. 130-02-06, LaSalle Parish;

La.—**H. L. Allen & Sons**, Elton, La., LB $118,397, grading, concrete revetments, rein.-con. box culvert, concrete slab bridge and approaches and related work, 0.116 mi. Rtes. LA 1, LA 76 and LA-US 190, SP Nos. 228-06-10, 8-01-15, 8-02-14 and 52-02-18, West Baton Rouge and Pointe Coupee Parishes. CD 11/14;

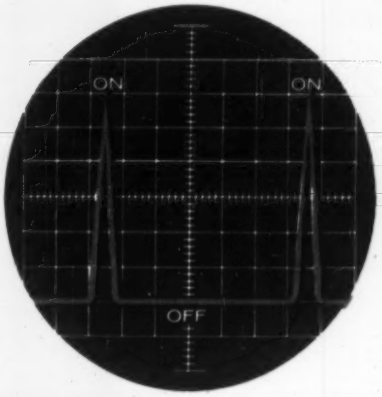
La.—**Sam Carline, Inc.**, Box 138, Berwick, La., LB $333,403, aggreg. type or soil cement base, bit. surf. treatment and other related work 9.932 mi. Bayou Sorrel-Pigeon Hy., Rte. LA 75, SP No. 230-03-06, FASP No. S-114 (1), Iberville Parish;

La.—**Coastal Contractors, Inc.**, Perkins Rd., Baton Rouge, La., LB $258,136, aggreg. type or soil cement base course, drainage structures, bit. surf. treatment and other related work 3.432 mi. Pierre Pass-Belle River Hy., Rte. LA 70, SP No. 232-01-27, Assumption Parish. CD 11/20.

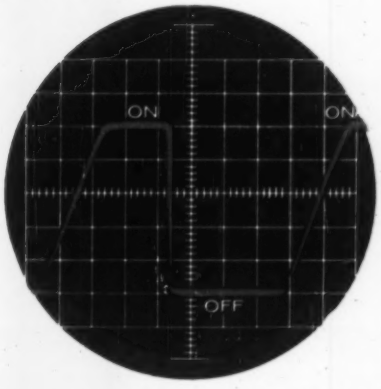
(Continued on page 130)



Visi-flash PATTERN. Note squared corners on the pattern produced. Visi-flash is instantly "on"; instantly "off" . . . no light variance, no excessive battery drain. "Off" time is set at optimum length . . . assures a pause long enough to rest the eye and make next flash meaningful.



NEON TUBE PATTERN. The Oscilloscope graphically illustrates "on" and "off" pulses of the light. It shows here that the neon tube flasher has an extremely short "on" time . . . too brief and fast to register strongly on eye and mind.



ORDINARY TRANSISTORIZED CIRCUIT PATTERN. Here, the "on" and "off" timing is not at ideal setting. Angled pattern shows that light strength varies and that excessive drain is set up on batteries as current slowly heats bulb prior to each flash.

Only DIETZ Visi-flash gives LONGER "On and Off" Timing for STRONGER Warning

ACCIDENT RECORDS indicate that rapidly flashing warning lights are seen, *but not heeded*. That's due to the fact that the human eye retains an impression of a flash from $\frac{1}{50}$ to $\frac{1}{30}$ of a second after it has vanished. If the flashes are rapid enough, the eye may imagine it sees a succession of diminishing flickers that are not there. The result is confusion, not action.

Only a long, steady flash registers a meaningful warning on the human mind. *Only a longer "off" time* enables the human eye to recover from one flash and see the next one clearly. The Dietz Visi-flash is timed to give the most ideal "on" and "off" timing of any flashing signal on the market.

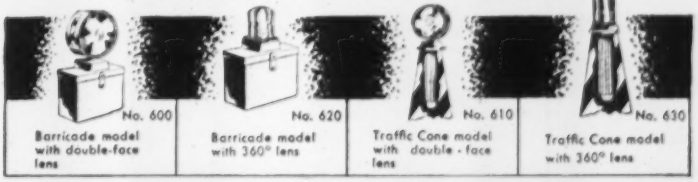
◀ **For Proof, See the Oscilloscope Patterns at Left**

DIETZ ENGINEERS have skillfully balanced the "on" and "off" timing of the Visi-flash with the design, color and area of the lens to produce a warning light that says "STOP – DANGER" in a way that combines visibility with meaning and authority.

Visi-flash is

- Highly visible
- Easy on Batteries
- Shock resistant
- Weather proof
- Easier to maintain
- Longer lasting
- Lower in cost

AVAILABLE IN TYPES FOR EVERY NEED



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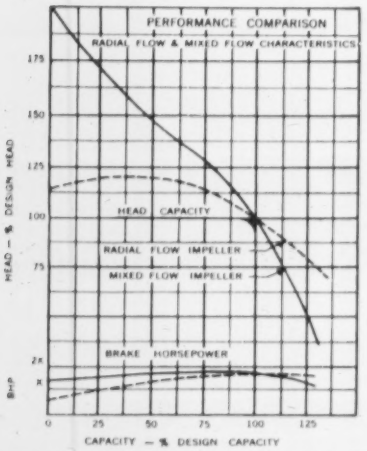
The flat head capacity characteristic of the Radial-Flow impeller is applied to systems such as fueling, condensate return, and cooling towers, which operate at constant pressure against varying capacities and under throttled conditions.

MIXED-FLOW

The steep head-capacity characteristic of the Mixed-Flow impeller is applied where constant capacity is required at fluctuating pressures such as pipeline pumps or units operating in parallel or series.



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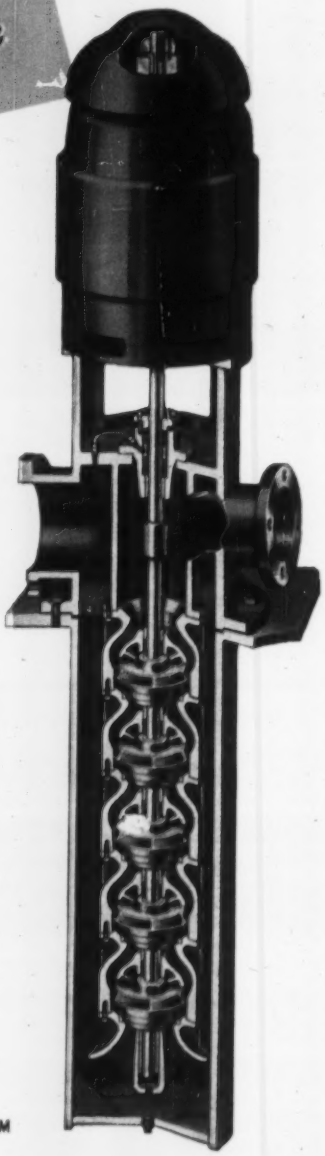

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(Continued from page 128)

TENNESSEE—State Hy. Dpt., Nashville, Bids opened 11/27.

Tenn.—**Forcum-Lannon, Inc.**, Dyersburg, Tenn. LB **$317,160**, widening 8 concrete deck girder bridges and approaches 0.865 mi. State Rte. No. 1 between Huntingdon and jct. of State Rte. Nos. 1 and 20 N.E. of Jackson, Proj. No. SP-2010-B Carroll and Madison Counties; LB **$111,127**, constr. 2 concrete deck girder bridges and approaches over North Fork of Obion River and Mill Creek 0.662 mi. section of Secondary Rte. No. 8172 between State Rte. No. 69 near Jones Mill and Puryear, Proj. No. S 8172-(2); Henry Co.;

Tenn.—**O. E. Willie & Son**, Franklin Rd., Nashville, Tenn. LB **$73,267**, widening existing concrete deck girder bridge 0.031 mi. across Browns' Creek on State Rte. No. 24 near east city limit of Nashville, Proj. SP-575-G, Davidson Co.; LB **$97,087**, widening and reconstr. bridge and approaches at Mill Creek 0.6 mi. State Rte. No. 11, approx. 1.75 mi. north of the Williamson Co. line, Proj. No. SP-2006-A Davidson Co.;

Tenn.—**Simpson Constr. Co.**, Cleveland, Tenn. LB **$124,072**, widening 3 concrete deck girder bridges and approaches 0.343 mi. section of State Rte. No. 30 between the Polk County line and Etowh, Proj. No. SP-2003-B, McMinn Co.;

Tenn.—**Roadbuilders, Inc.**, 718 Murfreesboro Rd., Nashville, Tenn. LB **$102,018**, constr. prestressed concrete girder bridge and approaches at Sulphur Fork Creek 0.279 mi. Secondary Rte. No. 6278 approx. 2.5 mi. south of Cedar Hill on State Rte. No. 11, Proj. No. S-6278-(3), Robertson Co.;

Tenn.—**Ford Constr. Co.**, Dyersburg, Tenn. LB **$117,611**, prestressed concrete deck unit overhead bridge and approaches 0.104 mi. over Illinois Central R.R. on Secondary Rte. No. 8104 at Frayser, Proj. No. S-8104-(3), Shelby Co. CD 11/7.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Bids opened 11/27.

Tenn.—**Burns & Baker**, Third National Bank Bldg., Nashville, Tenn. LB **$728,962**, constr. crushed stone base and paving with bit. materials (plant mix) section of State Rte. No. 1, 3.406 mi. beginning at Vaught's Gap near Bellevue and extending eastward across Nine Mile Hill to the N.C. & St. L. Overhead near jct. of State Rte. No. 100, Proj. No. F-001-4-(25), Davidson Co.; LB **$199,894**, surf. with crushed stone and the constr. 3 concrete box type bridges 4.438 mi. on section of Secondary Rte. No. 2533 beginning at Pigeon Forge and extending eastward via Williamsburg to the Oldham-Boogerton Rd., Proj. No. S-2533-(1), Sevier Co.; LB **$248,965**, surf. with crushed stone and constr. of one concrete deck girder bridge and 1 concrete slab type bridge on a section of Secondary Rte. No. 6302 beginning at Doaks Crossroads south of Lebanon and extending to the Lebanon City Limit, Proj. No. S-6302 (1), Wilson Co.;

Tenn.—**Unaka Paving Co.**, Johnson City, Tenn. LB **$367,319**, wid'n. existing roadway and small drainage structures and wid'n. and resurf. existing pavement with bit. materials (plant mix) 6.156 mi., section of State Rte. No. 16 beginning at N.W. City limit of Shelbyville and extending to a point north of Fall Creek, Proj. No. SP-2026-A, Bedford Co.;

Tenn.—**Nello L. Teer Co.**, Trust Bldg., Durham, N. C. LB **$2,369,163**, paving with crushed stone and bit. materials (plant mix) and constr. 6 bridges 6.672 mi. section of State Rte. No. 73-A beginning at State Rte. No. 33 near south city limit of Maryville and extending to State Rte. No. 73 near Aluminum Co. Plant entrance and on section of State Rte. No. 73 from Edison St. in Alcoa to point 0.5 mi. north of Knoxville Airport entrance, Proj. No. F-056-1 (17), Blount Co.;

Tenn.—**Anthony Excavating Service**, Maryville, Tenn. LB **$105,592**, surf. with crushed stone 3.009 mi. section of Secondary Rte. No. 2540 beginning at State Rte. No. 32 approx. 0.8 mi. N.W. of Jct. of State Rte. Nos. 9 & 32 and extending northerly for approx. 3 mi., Proj. No. S-2540 (1), Cocke Co.;

Tenn.—**Burton Constr. Co.**, Winchester, Tenn. LB **$156,583**, surf. with crushed stone and constr. 2 bridges 1.98 mi. section of Secondary Rte. No. 4291 beginning at point east of Duck River near Riverside and extending westward towards Normandy to point approx. 0.4 mi. east of Bedford Co. line, Proj. No. S-4291-(4), Coffee Co.;

Tenn.—**Ralph Rogers Co.**, 720 Argyle Ave., Nashville, Tenn. LB **$417,646**, wid'n. existing roadway and drainage structures (incl. 2 bridges) and wid'n., resurf. with bit. materials (plant mix) of a section of State Rte. No. 2, 4.138 mi. beginning at Noah's Fork Creek east of Beech Grove and extending 4.138 mi. towards Manchester, Proj. No. F-002-1-(8), Coffee Co.;

Tenn.—**Walker Constr. Co.**, 2313 Deerwood Dr., Nashville, Tenn., LB **$584,104**, constr. soil-cement base, surf. with bit. materials and constr. 4 concrete box type bridges on section of relocated State Rte. No. 20, 10.578 mi. beginning at Dyer County line west of Friendship and extending to near present State Rte. No. 20 approx. 1 mi. west of Alamo, Proj. No. F-020-2 (10), Crockett Co.; LB **$250,756**, paving with crushed stone and bit. materials (plant mix) and constr. concrete girder bridge across Elk River 0.772 mi. on State Rte. 7 beginning in Elkton and extending to a point 0.772 mi. south, Proj. No. FJ-007-1-(6), Giles Co.;

Tenn.—**W. T. Cutchins**, Dyersburg, Tenn. LB **$184,446**, surf. with gravel or chert and constr. 2 concrete deck girder bridges and 1 concrete box type bridge 6.401 mi. on section of Secondary Rte. No. 8008 beginning near the South Fork of Obion River and extending to State Rte. No. 43 approx. 1 mi. north of Greenfield, Proj. No. SP-8335, Gibson Weakley Counties;

Tenn.—**Norman & Horn Constr. Co.**, Blytheville, Ark. LB **$95,379**, surf. with gravel or chert section of Secondary Rte. No. 8031, 4.702 mi. beginning at State Rte. No. 5 near Fruitland and extending to Secondary Rte. No. 8032 near Gibson, Proj. S-8031 (9), Gibson Co.

Tenn.—**Wesco Constr. Co.**, Airport Rd., Chattanooga, Tenn., LB **$622,674** paving with crushed stone and bit. materials (plant mix) 2 lanes of 4 lane section of State Rte. No. 2 beginning at point near Hunter Rd. west of Wolftever Creek 1.457 mi. and extending to point east of Ooltewah, Proj. No. F-002-3 (24) Hamilton Co., widening of existing roadway and drainage structures and paving with crushed stone and bit. materials (plant mix) 2.47 mi. of a section of Interstate Rte. No. 502 beginning at east end of the Southern RR overhead bridge near Summit and extending to near Hunter Road west of Wolftever Creek Proj. No. I-502-(4), Hamilton Co.;

Tenn.—**B. G. Young & Sons**, Johnson City, Tenn. LB **$93,876**, surf. with crushed stone and the constr. 2 concrete box type bridges 1.784 mi. on section of Secondary Rte. No. 2461, beginning at point approx. 5.5 mi. NE of Elk Mills and extending towards Neva to the beginning of Proj. No. S-2461-(5) Proj. No. S-2461-(6) Johnson Co.;

Tenn.—**A. B. Long Constr. Co.**, Harriman, Tenn. LB **$3,789,626**, paving with c. conc. and constr. 11 bridges, (5 concrete box type and 6 concrete deck girders) 2.382 mi. on section of Interstate Rte. No. 507 in Knoxville, beginning at point near north city limit and extending southward to 5th and Galloway Aves. Proj. I-507 (3) Knox Co.;

Tenn.—**Ralph Mills Co.**, 410 Ann St., Frankfort, Ky. LB **$948,359**, paving with crushed stone and bit. materials (plant mix) and constr. concrete parking lanes, curbs and sidewalks 0.214 mi. on section of State Rte. No. 9 in Knoxville, beginning on Seahorn St. near McCalla Ave., and exten. to north city limit, Proj. No. U-009-2 (7) Knox Co.; paving with crushed stone and bit. materials (plant mix) constr. concrete parking lanes, curbs and sidewalks wid'n. pedestrian underpass bridge and constr. concrete, steel bridge 0.99 mi. for interchange at jct. of State Rte. Nos. 1 and 9 on section of State Rte. No. 1 in Krfoxville, beginning at Magnolia Ave. and Beaman St. and extending to point just north of Cedar St. near the north city limits. Proj. No. U-001-8 (15) Knox Co.;

Tenn.—**Thomas Bros.**, 5300 Dayton Blvd., Chattanooga, Tenn., LB **$84,255** resurf. with crushed stone and bit. materials 3.647 mi. section of Secondary Rte. No. 4303 beginning at Pocket Coal Mines and extending to State Rte. No. 108, at Griffith Creek Proj. No. S-4303-(3), Marion Co.;

Tenn.—**M. C. West**, Columbia, Tenn. LB **$183,658**, surf. with crushed stone and constr. 1 concrete deck girder bridge and 2 concrete slab type bridges 4.17 mi. on section of Secondary Rte. No. 4280 beginning at Archer and extending eaiterly towards Petersburg to Brown's Shop Proj. No. S-4280-(4) Marshall Co.;

Tenn.—**Oman Constr. Co.**, Acklen Park, Nashville, Tenn., LB **$502,772**, paving with crushed stone and bit. materials (plant mix) and constr. concrete parking lanes, curbs, sidewalks, a storm sewerage sys. and 1 concrete box type bridge 1.694 mi. on section of State Rte. No. 10 in Murfrees boro, beginning at State Rte. No. 1 near Carnation Road and extending to point approx. 0.5 mi. north of north city limits, Proj. No. UF-010-3-(6), Rutherford Co.;

Tenn.—**Rogers Bros. Constr. Co.**, Morristown, Tenn. LB **$77,062**, surf. with crushed stone 1.759 mi. section of Rural Rd. No. 2389 beginning at Coffee Ridge School and looping back along Slip Creek to beginning. Proj. R-2389-(1), Unicoi Co. CD 11/7.

BUILDINGS—LB & CA

▲ **Louis Richman, Inc.**, 3055-16th St. N.W., Arlington, Va., Owner Builds. **$2,000,000** 228 unit APARTMENT, Lee Hy. and George Washington Memorial Parkway, ARLINGTON, VA. Edwin Weihe, 927 15th St., N.W., Wash., D. C., archt.

▲ **Naples Constr. Co.**, 268 Broad Ave. S., Naples, Fla., LB **$1,424,000** (Base Bid) land 6 story, 200 X 370 ft. RIC (irreg.) concrete piling, COQUINA APARTMENTS, with swimming pool, NAPLES, FLA. Watkins & Barkau (Developers) Naples, Fla. Bids Nov. 26. CD 11/13.

▲ **Little Constr. Co.**, Box 1035, Charlotte, N. C., LB **$1,994,400**, HOSPITAL addn., SPARTANBURG, S. C. Spartanburg General Hospital, 855 N. Church St., Spartanburg, S. C. Bids Nov. 26. CD 11/14.

Mathis Constr. Co., Box 1106, Athens, Ga., CA **$911,466**, low-rent HOUSING, ATHENS, GA. Athens Housing Auth., Social Bldg., Broad St., Athens, Ga. Bids Oct. 29. CD 11/7, under LB.

▲ **Claussen-Webster**, Box 841, Augusta, Ga., LB **$1,147,434**, RETAIL STORE BLDG., AUGUSTA, GA. Sears, Roebuck & Co., 732 Broad St., Augusta, Ga. Aydelott & Assocs., 2080 Peabody Ave., Memphis, Tenn., archts.

▲ **Kaminer Constr. Corp.**, Box 227, Chamblee, Ga., CA **$1,353,547**, (incl. deduction for Alt. 1.) RADIATION EFFECTS LABORATORY, for Dpt. Air Force, AF Proj. 114 G-8, DAWSONVILLE, GA. Lockheed Aircraft Corp., Marietta, Ga. Bids Nov. 12, awarded Nov. 25. CD 5/2/56.

C. C. Robertson Co., Box 169, Colbert, Ga., CA **$896,500**, Ga. Proj. 200 constr. WAYNE COUNTY MEMORIAL HOSPITAL, JESSUP, GA. Wayne Co. Hospital Auth., Court House, Jessup, Ga. Bids Oct. 29, awarded Nov. 26. CD 11/7.

Burk Constr. Corp., 12777 NE 14th Ave. N., Miami, Fla. LB Approx. **$800,000**, Miami Airport MOTOR HOTEL, 2373 NW LeJeune Rd., MIAMI, FLA. Ben Gaines, c/o Mackay & Gibbs, archts. 927 Arthur Godfrey Rd., Miami, Fla. Bids Nov. 1. CD 10/30.

(Continued on page 133)

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BLAW-KNOX MODEL 85 ROAD WIDENER AT WORK NEAR KNOXVILLE, TENNESSEE. POWER: CONTINENTAL RED SEAL.

. . . two Famous Names: Continental and Blaw-Knox

Like so many other leading builders of construction machinery, Blaw-Knox offers its customers the tangible PLUS-value of Continental power. Continental engineers each power plant to the specialized requirements of its job, for highest dependability, longest trouble-free life.

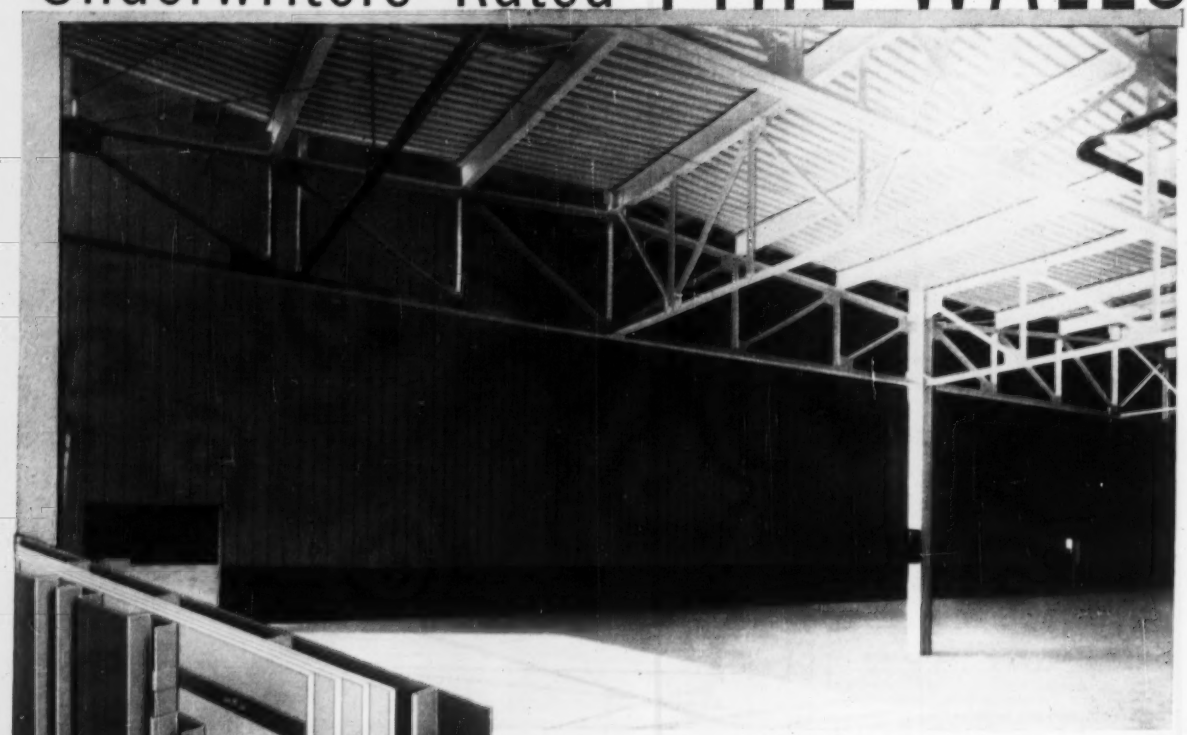
WORLD'S LEADING INDEPENDENT MANUFACTURER OF INTERNAL COMBUSTION ENGINES, CONTINENTAL MOTORS OPERATES PLANTS IN ATLANTA, DALLAS, DETROIT, MILWAUKEE, MUSKEGON, AND TOLEDO, AND IN ST. THOMAS, ONT., PRODUCING AIR-COOLED AND LIQUID-COOLED ENGINES FOR USE ON LAND, AT SEA AND IN THE AIR.

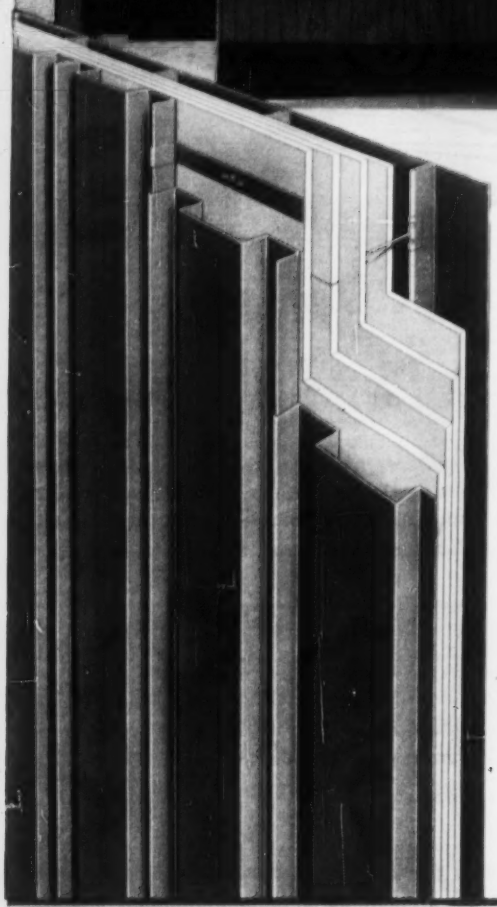
Continental Motors Corporation

MUSKEGON • MICHIGAN

FACTORY-AUTHORIZED SERVICE AND GENUINE RED SEAL PARTS ARE AVAILABLE EVERYWHERE

Underwriters' Rated FIRE WALLS





Section of Mahon Metalclad Fire Wall showing Construction Features. Four layers of ½" Plaster Board are sandwiched between Roll-Formed Steel Wall Plates. All Joints in both Wall Plates and Plaster Board are Offset.

. . . for Interior or Exterior Use!

Mahon Underwriters' Rated Metalclad Fire Walls are now available for use as interior dividing fire walls or as exterior curtain-type fire walls. They can be installed in old or new buildings, of either steel or reinforced concrete construction, where a fire hazard may exist, or where the requirements of Fire Insurance Underwriters or Building Codes must be met. The Mahon Metalclad Fire Wall is field constructed. It has been tested by the Underwriters' Laboratories, Inc., and has been given a Two-Hour Rating for use as either an interior or exterior fire wall. When employed as an exterior wall, Fiberglas insulation can be inserted between the interlocking ribs of the inner wall plates, thus providing insulating properties superior to that of a conventional masonry wall with furred lath and plaster. Exterior Wall Plates may be Aluminum, Stainless Steel or Enamel Coated Cold Rolled Steel. The important feature of the Mahon Fire Wall is the Impaling Clip with its Stainless Steel Spike (Patents Pending) which permits construction of the wall with a minimum of through metal. Mahon engineers will cooperate fully in supplying information and assistance in adapting this product to your particular requirement. See Sweet's 1958 Files for information, or write for Catalogue W-58.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of Underwriters' Rated Metalclad Fire Walls; Insulated Metal Curtain Walls; Steel Roof Deck and Long Span M-Decks; Acoustical and Troffer Forms; Electrified M-Floors; Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Fire Doors and Fire Shutters.

MAHON

(Continued from page 131)

Mouton & Sons, Box 870, Lafayette, La., CA $755,728, Eator Park ELEMENTARY SCHOOL and East Abbeville ELEMENTARY SCHOOL, ABBEVILLE, LA. Vermillion Parish School Bd., G. J. Lodget, supt., Abbeville, La. Bids Nov. 14. CD 11/7.

▲ **Gervais Favrot Co.**, 330 Balter Bldg., New Orleans, La., CA $1,496,759, 105,000 sq. ft. masonry Francis W. Gregory JUNIOR HIGH SCHOOL, NEW ORLEANS, LA. Orleans Parish School Bd., 703 Carondelet St., New Orleans, La. Bids Nov. 9, awarded Nov. 26. CD 10/22.

Nally, Gibson & Schoffner, Springfield, Ky., CA $430,000 (4 bidders), Consolidated HIGH SCHOOL, FALMOUTH, KY. Pendleton Co. Bd. Educ., Falmouth, Ky. Ed. J. Beiting, Jr., 1002 Monmouth, Newport, Ky., archt. Bids Dec. 2. CD 11/11.

A. J. Schneider Constr. Co., 7th St. Rd., Louisville, Ky., CA $798,100, 3 story, 47 x 171 ft. brick over concrete block, rein.-con. HOSPITAL addn., MADISONVILLE, KY. Hopkins County Hospital, Madisonville, Ky. Bids Sept. 26. CD 10/3, under LB.

▲ **Three A-Builders**, 1270 Maxwell, Evansville, Ind., Owner Builds, $1,000,000, SHOPPING CENTER, Lone Oak and Kennedy Rd., PADUCAH, KY. Constr. early 1958.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

December 17 Wisconsin

STREETS AND ROADS

December 17 Ohio, Wisconsin

BUILDINGS—BA

▲ **Mich., Ann Arbor**—RESEARCH CENTER—BA 12/17—Parke, Davis & Co., Harry J. Loynd, pres., Joseph Campau St., Detroit, research center consisting 5 laboratory buildings. $10,000,000. Skidmore, Owings & Merrill, 100 West Monroe St., Chicago, Ill. archts. CD 12/10/56.

O., Louisville—SCHOOL—BA 12/18—Bd. Educ., Louisville, elementary school. $510,000. CD 11/20/56.

▲ **O., Amberly Village**—ADVERTISING DPT. SERVICE—BA 12/20—Procter & Gamble Co., Gwynne Bldg., Cincinnati, 125,000 sq. ft. advertising dpt. service bldg. $1,000,000. Cordes, Pressler, Houck & Assocs., 4939 Paddock St., Cincinnati, archts.

BUILDINGS—SLC

O., Cincinnati—CHURCH—Forest Chapel Methodist Church, c/o Rev. Fishburn, 22 Grove Lane, Glendale, Cincinnati, soon lets contract church, Sharon Rd. in Forest Park (Cincinnati). $500,000. Sullivan-Isaacs-Sullivan, 1800 Reading Rd., Reading, archts.-engrs. CD 4/11/57.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., Columbus, Zone 15, Bids opened 12/4;

O.—**J. A. Jones Constr. Co. of Charlotte, N. C.**, Box P.O. Box 18, Berlin Heights, O., LB $3,105,292, est. $3,442,200 (7bidders) Type T-71, SR 1-2.49, 1-1103 (25) 6.555 mi., Ashtabula Co.; LB $3,756,953, est. $4,152,000 (6 bidders) Type T-71 and structures, SR 1-6.00,5.54, 1-1105 (22) 3.95 mi., Medina and Wayne Counties;

O.—**The Horvitz Co.**, 4375 E. 146th St., Cleveland, O., LB $6,019,273, est. $6,536,500 (6 bidders) Type T-71, USR 42-(17.43-18.02) 1-1057 (5), (City of Cleveland) 1.326 mi., Cuyohoga Co.;

O.—**Maxon Constr. Co., Inc.**, 2600 Far Hills Ave., Dayton, O., LB $2,852,260, est. $3,127,500 (9 bidders) Type T-71 and structures, SR 1-15.82, 0.00, 1-1105 (10), 6.109 mi. Delaware and Morrow Counties;

O.—**Wander & Mason, Inc.**, 1028 Proprietors Rd., Worthington, O., LB $3,399,795, est. $3,612,000 (3 bidders). Type T-35 and B-70, USR 62-(12.56, SR 3-(13.70) 1-609 (9) (City of Columbus) 2.227 mi., Franklin Co.;

O.—**The Baker & Hickey Co.**, 2170 Eakin Rd., Columbus, O., LB $2,568,006, est. $2,916,000 (6 bidders) Type T-35 on B-70 and structures, USR 23DA-1.14 U-UG-1056 (1) 1-5999 (city of Columbus) 0.852 mi., Franklin Co.;

O.—**Ralph Myers Contg. Corp.**, P. O. Box 230, Salem, Ind., LB $2,953,654, est. $3,229,100 (11 bidders) Type T-71 and structures, USR 40-24.70; 1-529 (14) 4.812 mi., Licking Co.;

O.—**The Crawford Constr. Co., Inc.**, 782 Charles St., Galion, O., LB $197,061, est. $196,900, (9 bidders) Type T-35 on B-119 SR 43-(0.00-1/72) F.-225 (4) and structure, 1.394 mi., Stark Co. CD 11/13.

Walker-Fauber, Inc., Ashland, O., CA $557,257, expansion of city sewerage system, ASHLAND, O. City of Ashland, City Hall, Ashland, O. Awarded Nov. 26. CD 9/25.

▲ **S. A. Healy Co.**, 20 N. Wacker Dr., Chicago, Ill., LB $1,593,080, NW Expressway, main drain from Foster to Sunnyside Aves. Proj. BU-265 (29), CHICAGO, ILL. Cook Co., County Bldg., Bids Nov. 26. CD 11/19.;
Paschen Contractors, Inc., 2739 N. Elston Ave., Chicago, LB $1,009,760, NW expressway, main drain from Nashville to Foster Aves., Proj. BU-265 (30), (Chicago, Ill.)

▲ **Material Service Corp.**, 300 W. Washington Blvd. Chicago, Ill., LB $838,702, concrete girders for 8 overpasses for South Superhighway at 71, 75, 76, 79, 83, 87, 91 and 95 Sts., Proj. I-04-8; LB $136,014, fabricating, del. prestressed concrete girders Proj. 267-15D, NW Expressway at intersection with Austin Ave. also pedestrian bridge at Nagle Ave.; LB $483,129, fabricating, del. prestressed concrete girders Proj. BU-265 (21) NW Expressway at Harlem, Oriole & Cumberland Aves. and Canfield Ave.; LB $280,264, fabricating, del. prestressed concrete girders Proj. BU-265 (20), NW Expressway at Natoma and Sayre Ave. and East River Rd., CHICAGO, ILL. Cook Co., County Bldg. Chicago, Ill. Bids Nov. 26. CD 11/19;
Allied Structural Steel Co., 20 N. Wacker Dr., Chicago, Ill., LB $544,780, furnishing, del. structural steel Proj. BU-265 (18) grade separation NW Expressway at Foster and Central Aves. (Chicago, Ill.);
American Bridge Co., Div. U. S. Steel Corp., 208 S. La Salle St., Chicago, Ill., LB $460,706, fabricating, del. structural steel grade separation Proj. BU-265 (15) NW Expressway intersection with Ainsle Ave., grade separation at Lawrence Ave., Proj. 266-15D (Chicago, Ill.).

▲ **Palumbo Excavating Co.**, 2738 W. Harrison St., Chicago, Ill., CA $1,183,543, Edens Expressway, paving N. Bryn Mawr to Lawrence Ave., 6.542 ft., Proj. I-02-2(12), CHICAGO, ILL., Cook Co., Chicago, Ill. CD 11/12.

▲ **Thomas McQueen Co.**, 1313 Circle Forest Park, Ill., CA $1,069,623, Edens Expressway-interchange at Montrose Ave., grade separation over Edens Exp., 3 span post-tensioned concrete girder and slab; Proj. I-02-2(10), CA $1,610,654, Edens Expressway-interchange Lawrence Ave. and Foster, Proj. I-02-2(3), CHICAGO, ILL., Cook Co., Chicago, Ill. CD 11/12, under LB.

▲ **INDIANA**—State Hy. Comn., John Peters, chn., State House Annex, Indianapolis, Zone 4, Bids opened 11/26;

Ind.—**Harold Tharp & Son**, Fountain City, Ind., LB $362,925, est. $400,363, (4 bidders) 3-at 60 ft. rein.-con. arch over East Fork White-Water River on 10 St. in Richmond, and 0.236 mi. approach grading and c. conc. pavement, Contr. 4136, UX-402 (3), 27-CC-3748, Wayne Co.;

Ind.—**Smith & Johnson Inc.**, 1799 Kentucky Ave., Indianapolis, Ind., LB $785,140, est. $918,185 (7 bidders), 11 rein.-con. girder spans, 0.8 mi. E. of Spencer at Penn. R.R. and West Fork White River, and 0.06 mi. approach grading and rein.-conc. pavement, Contr. 4260, F-123 (4), 46-E-2201, Owen Co.;

Ind.—**Robert H. King**, Danville, Ind., LB $97,146, est. $122,774 (9 bidders), 3 cont. 30 ft. spans over Kokomo Creek, 1.9 mi. south of US 35 and SR 32 (Kokomo By-pass), and 0.076 mi. approach grading and c. conc. pavement, Contr. 4261, U-771 (11), 31-P-3647J, Howard Co.;

Ind.—**L. I. Griffin & Sons Inc.**, 5002 S. Hanna St., Ft. Wayne, Ind., LB $175,133, est. $201,513 (7 bidders) 5 rein.-con. girder spans over Wildcat Creek, 0.7 mi. north of US 35 and SR 32 (Kokomo By-pass), and 0.067 mi. approach grading and c. conc. pavement, Contr. 4262, U-771 (15), 31-Q-3648J, Howard Co.;

Ind.—**McCalman Constr. Co.**, Danville, Ill., LB $88,099, est. $99,793 (5 bidders), 1 at 96 ft. rein.-con. arch over Sugar Creek, 0.8 mi. N. of State Road 47, 2.6 mi. E. of US Road 41, and 0.171 mi. approach grading and comp. aggregate base with hot bic. conc. surf., Contr. 4263, S-429 (1), Parke Co., CD 11/13.

MICHIGAN—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing;

L. W. Lamb Co., Holland, Mich., CA $506,041, est. $580,000, three bridges US-31 southbound over Black River, County Rd. 452 and C. & O. R.R. tracks, ½ mi. northeast of Holland, F-B1 of 70-7-3 C3-RN F-X1 of 70-7-3 C3-RN F-B2 of 70-7-3-C3-RN (F 155 32), Ottawa Co. Bids Nov. 20. CD 12/2, under LB.

▲ **MICHIGAN**—State Hy. Comm., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing,

Paul C. Miller, Sparta, Mich., CA $2,189,186, est. $2,220,000, dual b. conc. and aggreg. base course, 5 grade separations 6.04 mi. US-31 from Third St. in Ferrysburg north to Pike Rd. BM 61074 C3 RN BM 70015, Muskegon and Ottawa Counties. Bids Nov. 20. CD 12/2, under LB.

▲ **Suddan & Sivier, Inc.**, 13100 Cloverdale, Oak Park, Mich., **Chase Co.**, Harper Woods, Mich., and **Northeast Constr. Co.**, 2987 Helen Ave., Detroit, Mich., CA $1,261,454, Sec. 2; sanitary sewers and sewage pumping stations, GIBRALTAR, MICH. Village Joseph Collins, clk., 29540 Munro, Gibraltar, Mich. Bids Oct. 28. CD 10/11.

BUILDINGS—LB & CA

R. S. Ursprung Co., Hanna Bldg. Annex, Cleveland 15, O., CA Est. $850,000 (1 bidder) 3 story, brick, steel LIBRARY, BEREA, O. Baldwin Wallace College, Berea, O. Mellenbrook, Foley & Scott, 20 Beach St., Berea, O., archts. CD 2/19.

Bernard Naber, 5547 Cheviot Rd., Cincinnati, O., Own Forces, $975,000, fifty-two 1 story, bsmnt., brick, HOMES, West Fork Rd., CINCINNATI, O. Ed. Niemeier, 4484 Harrison Ave., Cincinnati, O., engr. CD 5/23.

▲ **Wermuth, Inc.**, 1036 St. Mary's St., Fort Wayne, Ind., CA $1,000,000, ADMINISTRATION BLDG. within exterior walls of present Antioch Hall, to convert old 3 story bldg. of 48,000 sq. ft. into air-conditioned 4 story new bldg. with 60,000 sq. ft., etc., YELLOW SPRINGS, O. Bd. Trustees, Antioch College, Yellow Springs, O. CD 6/3.

Mercury Bldrs., 761 S. Harlem Ave., Forest Park, Ill., LB $946,605, HIGH SCHOOL AND GYM. Unit 4—Ridgeland and 115th Sts., 1 and part 2 story, BLUE ISLAND, ILL. School Dist., 218, 127th and Sacramento, Blue Island, Ill. CD 11/18.

▲ **Chell & Anderson, Inc.**, 5425 N. Kedzie Ave., Chicago, Ill., CA $2,725,475, 2 story, brick, stone Stephan Tyng Mather HIGH SCHOOL, California and Peterson Sts., CHICAGO, ILL. Chicago Bd. Educ., 228 N. LaSalle St., Chicago, Ill. CD 11/25.

B. W. Handler Constr. Co., 223 W. Jackson Blvd., Chicago, Ill., CA $974,603, 81 unit, 8 story APARTMENT, 5701 S. Drexel Blvd., CHICAGO, ILL. University of Chicago, Midway and Woodlawn Sts., Chicago, Ill. E. R. Gritschke & Assoc., 11 S. LaSalle St., Chicago, Ill., mech. engrs. CD 10/28, under LB.

Kay & Ess Constr. Co., 4554 W. Irving Park Rd., Chicago, Ill., CA $701,824, CHURCH, 40th Pl. and Sacramento, CHICAGO, ILL. Parish of St. Pancratius, 4025 S. Sacramento Ave., Chicago, Ill. CD 11/6.

▲ **Frontier Constr. Co.**, 19320-James Couzens, Detroit, Mich., CA $4,200,000, 300 brick HOUSES, Fillmore and Westlake, "Monterey Park", TAYLOR, MICH. Denwood Realty Co., 24417 Ford Rd., Dearborn, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

December 20 Kansas

STREETS AND ROADS

December 19, 20 Kansas December 20 Minnesota

December 20 North Dakota

Kan., Dodge City—BA 1/8—City, c/o Merle E. Smith, clk., sewage treatment plant, grit chamber, 2 primary basins, 2 trickling filters, 1 final basin, lift station, sludge control house and digester, $600,000. Plans deposit $20. Black & Veatch, 1500 Meadow Lake Parkway, Kansas City, Mo., engrs. CD 2/15/56.

▲† **Oklahoma**—BA 1/9—Bureau Reclamation, Dpt. Interior, Anadarko, Fort Cobb Dam, Washita Basin, Proj., near Fort Cobb, earth fill dam embankment approx. 9,900 ft. long at the crest, Spec. No. DC-4988, extended date. CD 10/23.

▲† **North Dakota**—TRANSMISSION LINE—BA 1/16—Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars delivery point for domestic bidders; f.o.b. cars at West Fargo, for foreign bidders, Schedule Item No. 1, one 25,000 KVA, 13,800 volt, 3 phase, 60-cycle, hydrogen-cooled outdoor-type synchronous condenser, with control equipment for Fargo sub-station, Transmission Div., North Dakota, Missouri River Basin Project, Inv. DS-5001. CD 9/13/23.

BUILDINGS—BA

▲† **Okla., Altus**—HOUSING—BA 12/19—Porch & Contg. Office, State Historical Society Bldg., Oklahoma City, Zone 5, 700 family Capehart Housing units, Altus Air Force Base, Inv. No. 34-612-58-9, $7,000,000. Extended date. Hudgins, Thompson & Ball, 1411 Classen, Oklahoma City, engrs. CD 11/20.

▲† **Minnesota**—POWER PLANT—BA 1/11—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D.C., design, develop, construct and test operate boiler water nuclear reactor and conventional fuel-fired superheater power plant on system Rural Cooperative Power Assn., Elk River. CD 10/15.

▲ **Tex., Houston**—SCHOOL—BA 1/16—Houston Ind. school Dist., 1300 Capitol St., Burrus Senior High School, $2,100,000. Plans deposit $100. MacKie & Kamrath, 2713 Ferndale Pl., archts. Walter P. Moore, 2 Pinedale St., and Raymond L. Jenkins, 2622 Richmond St., engrs. CD 6/8/56.

Okla., Sulphur—HOSPITAL—BA 1/22—Murray Co., contr. Murray County Hospital, $400,000. Extended date. Harold Flood, 1110 Hargrove, Ardmore, archt. CD 10/24.

HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul, Bids opened 11/29;

Minn.—**H. J. Frederickson**, Cannon Falls, Minn., LB $298,215 (7 bidders), grading 13.2 mi. Littlefork SP 3609-05 (T.H. 65-159), Minn. Proj. S 404 (1), Koochiching Co.;

Minn.—**L. Joyce**, Rochester, Minn., LB $199,203 (6 bidders), grading 7.5 mi. between south jct. T.H. No. 22 southeast of Mapleton and East Co. line incl. bridge, SP 0707-02 (T.H. 30-82) and SP 0707-03, Blue Earth Co.;

Minn.—**Berghuis Constr. Co.**, Prinsburg, Minn., LB $370,209 (17 bidders), grav. base 15.7 mi. between 0.5 mi. north of Leader and 4 mi. south of jct. T.H. No. 87, SP 1109-09 (T.H. 64-193), Minn. Proj. S. 4082 (1), Cass Co.;

Minn.—**Central States Constr. Co.**, Crosby, Minn., LB $640,624 (11 bidders), concrete paving 12.2 mi. between 3.8 mi. south of Ryeland and East Grand Forks, SP 6614-09 (T.H. 220-220), Minn. Proj. F 050-1(1), Polk Co.;

Minn.—**Hallett Constr. Co.**, Crosby, Minn., LB $1,008,517 (8 bidders), base and c. conc. 10.3 mi. between 1 mi. east Lake Park and 0.4 mi. west of Detroit Lakes, SP 0301-12 (T.H. 102-2), Minn. Proj. F 002-1 (8), Becker Co.;

Minn.—**Anderson & Sons, Inc.**, 100 North Seventh St., Minneapolis, Minn., LB $659,606 (8 bidders), base and c. conc. paving 10.2 mi. between LeCenter and Montgomery, SP 4002-25 (T.H. 13-13) Minn. Proj. F 013-1(3), LeSueur Co. CD 11/14.

Worthington Corp., 400 W. Madison St., Chicago, Ill. LB $541,250. general contract, turbine, light and power extensions, SPENCER, IOWA City, City Hall, Spencer, Iowa. Bids Nov. 19. CD 10/31;
Elliott Co., Jeanette, Pa. LB $87,000. condenser, (Spencer, Iowa);
Wickes Boiler Co., 515 N. Washington St., Saginaw, Mich. LB $435,140. boiler, (Spencer, Iowa).

Layne-Western Co., 1011 W. Harry, Wichita, Kan., LB $776,405, Contract 6, water supply wells; Contract 8, well pumps, appurtenances, WICHITA, KAN. City, City Hall, Wichita, Kan. Bids Nov. 18. CD 10/21, under LB.

Mitchell Darby Constr. Co., Box 169, Mc Allen, La., CA $528,820. high service water pumping station, Flagle St., SAN ANTONIO, TEX. City Water Bd., 106 W. Market St., San Antonio, Tex. Bids Nov. 8. CD 11/20, under LB.

Elm Fork Constr. Co., Inc., Box 13186, Dallas, Tex., LB $517,954. sanitary sewer and outfall sewer lines, SWEETWATER, TEX. City, City Hall, Sweetwater, Tex. Bids Nov. 25. CD 11/7;
H. B. Zachry Co. Constr. Div., Box 10188, San Antonio 21, Tex., LB $380,907 sewage treatment plant (Sweetwater, Tex.).

▲† **Long Constr. Co.**, 1165 S. Pennsylvania St., Denver, Colo., LB $1,086,534, approx. 31,545 sq. ft. staff club at Air Force Academy, IFB 05-613-58-11, ◦COLORADO SPRINGS, COLO. Dpt. Air Force, Box 1670, Colorado Springs, Colo. Skidmore, Owings & Merrill, 3333 N. El Paso St., Colorado Springs, Colo., engrs.-archts. Bids Nov. 26. CD 8/8.

BUILDINGS—LB & CA

D. L. Witcher, Inc., Bldrs. Exchange Bldg., Minneapolis, Minn., CA $891,173, HIGH SCHOOL Addn. and new ELEMENTARY SCHOOL, LAKE CITY, MINN. Bd. Educ., L. Wichstrom, clk., Lake City, Minn. Bids Nov. 21. CD 12/3, under LB.

Walter A. Zlogar, Inc., McNett Bldg., Ottumwa, Iowa. CA $547,282. general contract 2 SCHOOLS, OTTUMWA, IOWA. Bd. Educ., Ottumwa, Iowa. Bids Nov. 20. CD 10/4.

Weidemann Constr., Clinton, Mo., LB $790,000, HIGH SCHOOL, CARROLLTON, MO. Carroll Co. Bd. Educ., R-VII Dist., c/o W. L. Adams, supt. Schools, Carrollton, Mo. Bids Nov. 26. CD 11/12.

▲ **Prom Investment Co.**, c/o Abe Yeddis, 7500 E. 12 St., Kansas City, Mo., rejected bids Oct. 9, 6 story, rein.-con., brick, concrete block MOTEL, KANSAS CITY, MO. LB $1,704,954. Will re-advertise. CD 10/22, under LB.

▲ **McCarthy Bros. Constr. Co.**, 4903 Delmar Blvd., St. Louis, Zone 8, Mo. CA $2,439,940 (11 bidders), 1 story, 419 x 660 ft., brick, steel (erection only) steel joists, masonry blocks, etc. WAREHOUSE and OFFICE; 60 x 340 ft. covered drive, railroad deck, etc. GARAGE, on 63 acre tract US-66, HAZELWOOD (St. Louis 15 P.O.), MO. The Kroger Co., G. H. Scott, 35 E. 7 St., Cincinnati, O. and Robert A. Hughes, regional mgr., 1311 S. 39th St., St. Louis 10, Mo. Bids Nov. 19. CD 11/4.

▲ **Sioux Falls Constr. Co.**, 800 S. 7th St., Sioux Falls, S. D. CA $1,429,068. general constr. HOUSING at South Dakota State College, BROOKINGS, S. D. State Bd. Regents, Pierre, S. D. Bids Nov. 1. CD 11/18, under LB.

Warner Constr. Co., P.O. Box 769, San Angelo, Tex. CA $728,472. JUNIOR HIGH SCHOOL and ELEMENTARY SCHOOL and 3 room addn. to Travis ELEMENTARY SCHOOL and 4 room addn. to Bowee ELEMENTARY SCHOOL, CORSICANA, TEX. Corsicana Ind. School Dist., c/o Robert Ashworth, supt., Corsicana, Tex. Bids Nov. 27. CD 10/15.

C. H. Leavell & Co., Box 1829, El Paso, Tex., LB $557,009. STUDENT UNION CENTER, EL PASO, TEX. University of Texas, c/o Bd. Regents, Main Administration Bldg., Austin, Tex. (for Texas Western College at El Paso, Tex.) Davis-Foster-Thorpe & Assocs., Mills Bldg., El Paso, Tex., engrs.-archts. CD 3/18.

Blanke Mechanical Contractors, 2112 Mistletoe Blvd., Fort Worth, Tex. CA $640,990. modernization MEDICAL ARTS BLDG., FORT WORTH, TEX. Houston Endowment Fdn., c/o Clay J. L. Berry, Fair Bldg., Fort Worth, Tex. Bids Nov. 19. CD 9/25.

Benson Co. Builders, 3316 Sul Ross St., Houston, Tex., CA $550,000. DWELLINGS, HOUSTON, TEX. Walter W. Fondren, Jr., 3619 Knowlwood St., Houston, Tex. CD 12/3.

▲ **Olson Constr. Co.**, 840 S. Jason St., Denver, Colo., LB $2,105,800 (cost plus fixed fee basis) general contract SHOPPING CENTER (first phase), incl. 2 story, part bsmnt., 151,400 sq. ft. for May Co., four 1 story shop bldgs., 33,934, 33,034, 66,008 and 97,122 sq. ft., LAKEWOOD, COLO. The May Co., 10th and Champa Sts., Denver, Colo., and Stores Realty Co., 6067 Wilshire Blvd., Los Angeles, Calif. Bids Nov. 5;
Dependable Co., 4700 W. Colfax St., Denver, Colo., LB $273,328, plumbing contract, shopping center, (Lakewood, Colo.);
Collier Electric Co., 700 W. 13th St., Denver, Colo., LB $397,000 electrical contract, shopping center (Lakewood, Colo.).

FAR WEST

BUILDINGS—BA

▲ **Wash., Moses Lake**—SCHOOL, etc.—BA 12/19—School Dist. 161, Moses Lake, 7 steel frame bldgs. and power plant, totaling 110,000 sq. ft. for Senior High School, $1,350,000. Plans deposit $50. Hovind, Harthorne & Smith, 1500 Westlake Ave. N., Seattle, engrs. CD 4/30.

▲ **Calif., Los Angeles**—JUNIOR HIGH SCHOOL—BA 12/20—Bd. Educ., 1425 S. San Pedro St., Parkman Junior High School. $2,400,000 A. C. Zimmerman, 2439 Hyperion Ave., Los Angeles, archt. CD 4/8/55.

▲ **Calif., Oakland**—SCHOOL—BA 1/7—Oakland Unified School Dist., 1025 2 Ave., concrete frame Lowell Junior High School, 14 and Market Sts. $1,200,000. Plans deposit $50. Warnecke & Warnecke, Financial Center Bldg., archts. CD 10/10/56.

▲ **Calif., Los Angeles**—STATE OFFICE—BA 1/8—State Div. Architecture, 1100 S. Grand Ave., 5 story, bsmnt. addn. 201,000 sq. ft. total area of 4 office floors, 158,000 sq. ft. hotel area, 2 parking floors to Division Hys. Dist. VII Office Bldg., W.O. 3444SC. $4,-857,000. Plans deposit $100. CD 5/18/56.

BUILDINGS—SLC

▲ **Calif., Sunnyvale**—INDUSTRIAL SUPPORT FACILITIES—Lockheed Aircraft Corp., Missile Sys. Div. P.O. Box 504, Sunnyvale, soon lest contract 153,000 sq. ft. U. S. Naval Industrial Support Facilities. $2,000,-000. CD 1/21, under Prudential Insurance Co., 763 Broad St., Newark, N. J., as owners.

HEAVY CONSTRUCTION—LB & CA

▲† **Sierra Constr. Co.**, Box 2281, Huntridge Station, Las Vegas, Nev. LB $2,058,325. 30,000 sq. ft. mechanical assembly BLDG., guardhouse, warehouse and office, grading, paving, small amount railroad track at Jackass Flats, MERCURY, NEV. Atomic Energy Comm., 1235 S. Main St., Las Vegas, Nev.

F. Coluccio Constr. Co., 7778 Seward Park Ave., Seattle, Wash. CA $537,171. interceptor sewer in Harbor Ave. S.W., SEATTLE, WASH. City, County-City Bldg., Seattle, Wash. Bids Nov. 20, awarded Nov. 27. CD 11/27, under LB.

S. S. Mullen, Inc., 646 Holgate St., Seattle, Wash. CA $815,636, est. $747,224. (11 bidders), grade separation structure at north end of Ballard Bridge, involving 350 ft. rein.-con. overpass on steel and wood piling foundations, and approach ramps, SEATTLE, WASH. City, County-City Bldg., Seattle, Wash. Bids Nov. 13, awarded Nov. 27. CD 11/20, under LB.

▲ **East Bay Municipal Utility Dist.**, c/o Secy., 2130 Adeline St., Oakland, Calif., rejected bids water storage reservoir, Spec. 702, near San Pablo, Contra Costa Co., CALIFORNIA. LB $1,528,257. Will re-advertise. CD 10/3, under LB.

† **CALIFORNIA**—Bureau P. Rds., Dpt. Interior, Old Mint Bldg., San Francisco,
John Delphia, P.O. Box 607, Patterson, Calif. LB $527,-901. (18 bidders), bit. surf. and bridge approx. 3.3 mi. long, Sierra National Forest, Madera Co. Bids Nov. 26. CD 11/14.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N. St., Sacramento,
Madonna Constr. Co., P.O. Box 910, San Luis Obispo, Calif. CA $1,052,253, grading, surf. 9.9 mi. Del Dios Hy. FAS Co. Rte. 728 between Rancho Santa Fe and Escondido, San Diego Co. Bids Nov. 7, awarded Dec. 2. CD 11/13, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 12/4.
Clyde W. Wood & Sons, Inc., Kirst Constr. Co. & Alwood Corp., P.O. Box 620, North Hollywood, Calif. LB $5,052,434 (11 bidders) joint venture, about 6 mi. 4 lane freeway on U. S. Hy. 40 between Hampshire Rocks and 0.5 mi. west of Soda Springs, Ill. Pla. Nev. 37-F.B., Placer and Nevada Counties. CD 11/12.

▲† **Darkenwald Constr. Co. & Vinson Constr. Co.**, 2131 Fulton Ave., Sacramento, Calif. LB $1,537,473, est. $1,375,212 (10 bidders) 363,000 cu. yd. excav., etc. for Putah South Canal and Green Valley Conduit and Subconduit, Solano Proj., DC 4986, near Fairfield, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Winters, Calif. Bids Dec. 3. CD 10/18.

Einer Bros., Inc., P.O. Box 936, Escondido, Calif., CA $833,000, installing Montgomery pipe line, Spec. 194, Doc. 558495, SAN DIEGO, CALIF. City Council, Civic Center, 1600 Pacific Hy., San Diego, Calif. Awarded Nov. 5. CD 10/9, under LB.

BUILDINGS—LB & CA

J. P. Hopkins Co., Mercer Island, Wash. CA $794,150. general contract 7 steel frame bldgs. totaling 84,000 sq. ft. for SOUTH SENIOR HIGH SCHOOL, 19 Ave. S. and S. 228 St., SEATTLE, WASH. Highline School Dist. 401, 253 S. 152 St., Seattle, Wash. Bids Nov. 19. CD 11/27, under LB.

Hart Constr. Co., 3536 E. 11 St., Tacoma, Wash. CA Est. $500,000. 1 story, 110,000 sq. ft. WAREHOUSE and FURNITURE FACTORY, TACOMA, WASH. Educators Mfg. Co., 721 E. 25 St., Tacoma, Wash.

M. & O. Constr. Co., 780 Commerce St., Tacoma, Wash. CA Est. $400,000. 40,000 sq. ft. GROCERY WAREHOUSE addn., TACOMA, WASH. West Coast Grocery Co., 1525 E. D St., Tacoma, Wash.

Barstow School Dist., Barstow, Calif., rejected bids Nov. 7, frame, stucco, 48,000 sq. ft. JUNIOR HIGH SCHOOL, BARSTOW, CALIF. LB $871,054. CD 11/18, under LB.

▲ **Stolte, Inc.**, 8451 San Leandro St., Oakland 21, Calif., LB $1,792,000 (11 bidders) HORTICULTURE and VITICULTURE BLDG., Davis Campus, DAVIS, CALIF. Office Architects & Engineers, University of California, Arboretum and Hutchison Dr., Davis, Calif. Bids Nov. 26. CD 11/11.

▲ **Babcock & Wilcox**, 161 E. 42 St., New York, N. Y., CA "Once-Through" type 1,638,000 lb. steam per hr., etc., STEAM GENERATOR known as "Universal Pressure" unit, HUNTINGTON BEACH, CALIF. Southern California Edison Co., 601 W. 5th St., Los Angeles, Calif. CD 1/23/56.

Hacienda Plaza Ltd., 17759 E. Valley Blvd., La Puente, Calif., Owner Builds. $697,500. 980-1,002 sq. ft., 93 DWELLINGS, Kennard St., Wilshire Ave., Lynbrook Ave., Macton Place, Ladysmith Place, LA PUENTE, CALIF.

▲ **Stolte, Inc.**, 8451 San Leandro St., Oakland, Calif. LB $1,201,466 (low net bid). (8 bidders), 3 story, 88,000 sq. ft., structural steel frame, wood, etc., Adams JUNIOR HIGH SCHOOL, Loring and Rosalind Sts., RICHMOND, CALIF. Richmond City Elem & Union High School Dist., c/o Supt., 1108 Bissell Ave., Richmond, Calif. Bids Nov. 27. CD 11/4;
Elmer J. Freethy, 1432 Kearny St., El Cerrito, Calif. LB $1,155,770 (base bid). Adams Junior High School (Richmond, Calif.)

▲ **Hass, Haynie & Frandsen**, Box 746, La Jolla, Calif. CA $1,415,000, 72,166 sq. ft. RESEARCH LABORATORY and 2 SCIENCE BLDGS.; CA $410,000, 29,500 sq. ft. LIBRARY BLDG., SAN DIEGO, CALIF. General Atomics Div., General Dynamics Corp., 1895 Hancock St., San Diego, Calif. CD 5/4/56.

▲ **Allison Honer**, 312 N. Main St., Santa Ana, Calif., CA $1,014,000. PSYCHIATRIC BUILDING Orange County General Hospital, SANTA ANA, CALIF. Bd. Supervs., Orange Co., Court House, Santa Ana, Calif. Bids Oct. 30. CD 9/24.

▲ **Crown Constr. Co.**, 5059 W. Pico Blvd., Los Angeles, Calif. LB $1,086,529, est. $700,000. (12 bidders), 40,000 sq. ft. rein.-con., brick GYMNASIUM at South High School, TORRANCE, CALIF. Torrance Unified School Dist., 2335 Plaza del Amo, Torrance, Calif. Bids Nov. 21. CD 11/8.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTING
BRIDGES
January 3 New Brunswick

BUILDINGS—BA

▲ **Man., Winnipeg**—DEPARTMENT STORE—BA 12/17—Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont., and 421 Portage Ave., Winnipeg, superstructure, 15,000 sq. ft. floor space department store on 15 acre site adjacent to Polo Park Shopping Center. $2,000,000. Green, Blankstein, Russell & Assocs., 222 Osborne St. N., archts. CD 6/20.

HEAVY CONSTRUCTION—LB & CA

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto, Bids opened 11/27.
Miller Paving Ltd., 56 Blake St., Toronto, Ont., LB $997,561 (12 bidders) Contr. No. 57-111, grading, granular base 10.3 mi. Hy. No. 11 from Kapuskasing to Harty, Kapuskasing. Bids Nov. 27. CD 10/28.
ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Warren Bituminous Paving Co. Ltd., P.O. Box 119, Downsview, Ont., LB $704,361 (13 bidders) Contr. No. 57-235, grading, gran. base and hot mix paving 5.6 mi. Hy. No. 11 from Newmarket to Bradford, Newmarket Co. Bids Nov. 27. CD 10/28.

BUILDINGS—LB & CA

Toronto Industrial Leaseholds Co. Ltd., 12 Sheppard St., Toronto, Ont. Owner Builds. $800,000. 86-suite APARTMENT, Keele St. and Denbigh Crescent, TORONTO, ONT. G. S. Freedman, 35 Isabella St., Toronto, Ont., archt.

George Wimpey & Co. Ltd., 80 N. Queen St., Toronto, Ont., CA $656,829, 8 story, bsmnt, 109-bachelor-suite, rein.-con., brick REGENT PARK NORTH HOUSING ANNEX, Old Oak St., TORONTO, ONT. Toronto Housing Auth., City Hall, Toronto, Ont. Bids Nov. 15, awarded Nov. 28. CD 11/22, under LB.

Shield Constr. Co. Ltd., 2349 Yonge St., Toronto, Ont. Owner Builds. $600,000, 7 story, 64 suite, masonry walls, rein.-con. frame for bottom 3 floors and structural steel frame for remaining 4 floors APARTMENT BLDG., concrete block and poured concrete fdns., TORONTO, ONT. Bregman & Hamann, 7 Adelaide St. E., Toronto, Ont., archts.

Berri Enterprises Ltd. and Placements O'Brien Blvd. Ltd., 11622 Barre St., St. Laurent, Montreal, Que. Owner Builds. $625,000. 5 block 17-suite each, 3 story, bsmnt., 59x84 ft., brick APARTMENT BLOCK, du Demaine St., MONTREAL, QUE. Ben-Ami Shulman, 517r Cote des Neiges Rd., Montréal, Que., archt.

Meteor Homes Ltd., 149 Westcliffe Ave., Pointe Claire, Que. Owner Builds. $900,000, HOUSING, 45 stone, brick split-level bungalows, GARAGE, Westcliffe Ave., MONTREAL, QUE. Ian Martin, 4693 Sherbrooke St. W., Montreal, Que., archt.

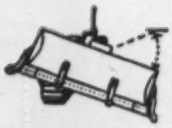
AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **Ralph M. Parsons Co.**, 617 S. Olive St., Los Angeles, Calif., U. S. A., CA $17,500,000, REFINERY, EMDEN, GERMANY. Erdoelwerke Frisia (Gottleib Duttwiler) Emden, Germany.

▲ **Taylor West Indies Constr. Corp.**, 2875 N. Lejeune Rd., Miami, Fla., U.S.A., LB Est. $3,500,000. 160-room HOTEL, ARUBA, NETHERLANDS WEST INDIES. N. V. Aruwen, Aruba, N.W.I. Bids Sept. 9. CD 8/9.
(Proposal Advertisement see p. 148)

NEW! THE CAT* NO. 7G BULLDOZER



Blade tilts 3′ to either side!

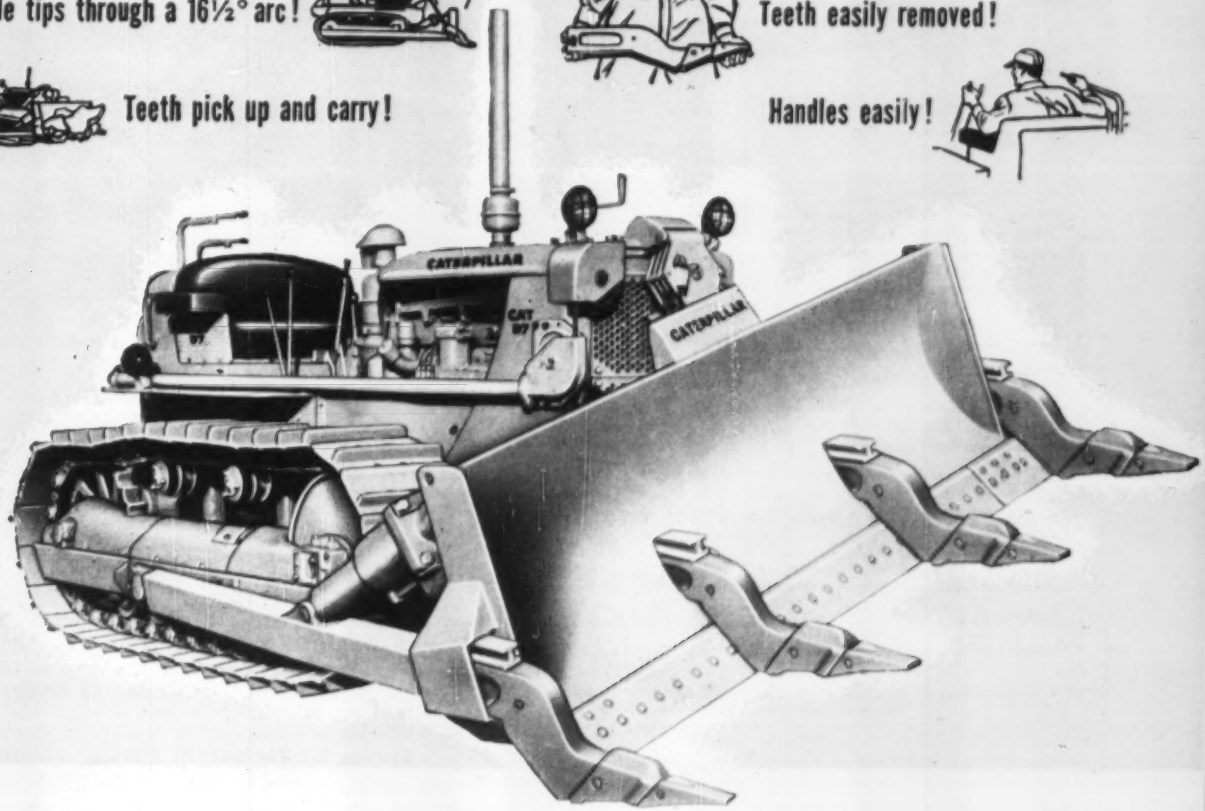
Blade tips through a 16½° arc!

Teeth pick up and carry!

Teeth slice through hard materials!

Teeth easily removed!

Handles easily!



DOZER AND RIPPER IN ONE

The brand-new Caterpillar No. 7G Bulldozer is a completely different type of bulldozer. The amazing tilt-tip action, and its four heat-treated cast steel teeth, are an entirely new concept in 'dozing. The Gyrodozer is both a 'dozer and a ripper.

YOU'LL GET HIGHER PRODUCTION

The Gyrodozer rips through hard or frozen materials. Its 23″ teeth not only pry out boulders but pick 'em up and carry 'em away. In rocky soil, the wedging action of the teeth surfaces small rocks for scooping up by the 10′ 10″ blade. On the really tough jobs, the tractor's full horsepower can be put behind a single tooth. The Gyrodozer is ideal for uprooting trees and clearing an area in a hurry.

EASY TO OPERATE

A Cat No. 25 Cable Control raises and lowers the 'dozer and a front-mounted No. 44 double-valve Hydraulic Control tips and tilts the blade. The operator never needs to leave his seat to make a blade adjustment.

GET FULL DETAILS

on the revolutionary new Gyrodozer from your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

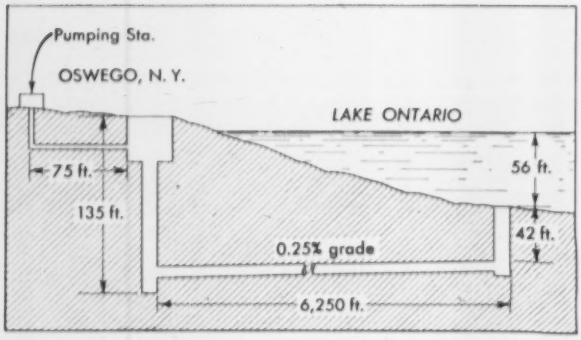
WANTED—
THE HARD WORK

It's not just a bit of metal you're buying... it's FEET OF HOLE!

Three Ingersoll-Rand JR-38B Jackdrills with 1⅛" Carset Jackbits, drilling through hard sandstone in the 8' diameter Oswego Water Tunnel. Thirty holes were drilled for each round, and two rounds were drilled, blasted and mucked per shift.

CARSET JACKBITS average 500 FEET

in Hard Sandstone on the OSWEGO TUNNEL JOB



Simplified schematic diagram of the Oswego Water Tunnel project. Drilling started with the 135 ft. access shaft and water riser. The upper 33½ ft. is square, the remainder being circular, 12 ft. in diameter. The 6,250 ft. tunnel, 8 ft. in diameter, was driven on a 0.25% up grade, to a point more than a mile out under the lake, ending 42 ft. below the lake bottom under a 56 ft. depth of water. A riser was driven upwards to within a few feet of the lake bed and the rock plug blasted free after which a strainer and inlet structure were set in place over the riser, a sump below tunnel line catching the muck. A 75 ft. tunnel 30'-0" below ground level carries water from the riser to the pumping station. Roof bolts were set in the main tunnel as a safety measure.

EXTENDING more than a mile out under the waters of Lake Ontario, the Oswego Water Tunnel brings an abundance of offshore fresh water to the city of Oswego, N. Y.

Driven by Herbert F. Darling, General Contractor, Williamsville, N. Y., this 6,250 ft. long tunnel, 8 ft. diameter, was drilled with Ingersoll-Rand JR-38B Jackdrills and 1⅛" Carset Jackbits. By sharpening the bits with machine precision on an I-R Jackbit Grinder and maintaining correct cutting angles bit footages were boosted from 300 to 500 feet. Rock was hard gray sandstone.

On-the-job performance like this — comparing *feet of hole per dollar of bit cost* — is the only true test of rock bit economy. Measure Carset Jackbits by this yardstick on any job, in any kind of rock. Compare them with any other bit you've ever used. The results will speak for themselves.

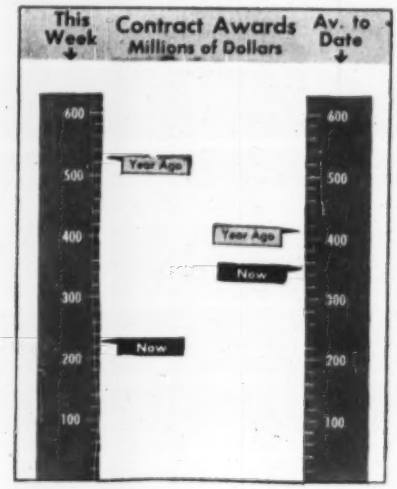
Ingersoll-Rand

15 – 668 11 Broadway, New York 4, N. Y.

ROCK DRILLS • COMPRESSORS • AIR TOOLS • TURBO BLOWERS • CONDENSERS • PUMPS • DIESELS • GAS ENGINES

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 50 wks 1957	Chge '56-'57 %
		millions	
Federal	$6.9	$2,145.8	+32
State and Municipal	105.4	7,134.6	+13
Total Public	112.1	8,280.4	+17
Total Private	114.4	8,166.0	−37
U. S. Total	$226.5	$17,446.4	−17
By Type of Work			
Waterworks	$13.1	$353.6	+2
Sewerage	8.1	527.6	−7
Bridges	10.7	764.6	+25
Highways	32.0	2,839.3	+20
Earthwork, Waterways	2.5	949.0	+35
Buildings:			
Public Excl. Housg.	38.7	2,281.5	+12
Public Housing	4.1	615.0	+95
Private Housing	55.9	2,971.3	−43
Commercial	29.5	1,693.8	−12
Industrial	24.5	2,995.4	−42
Unclassified	7.4	1,455.3	−18
U. S. Total	$226.5	$17,446.4	−17

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

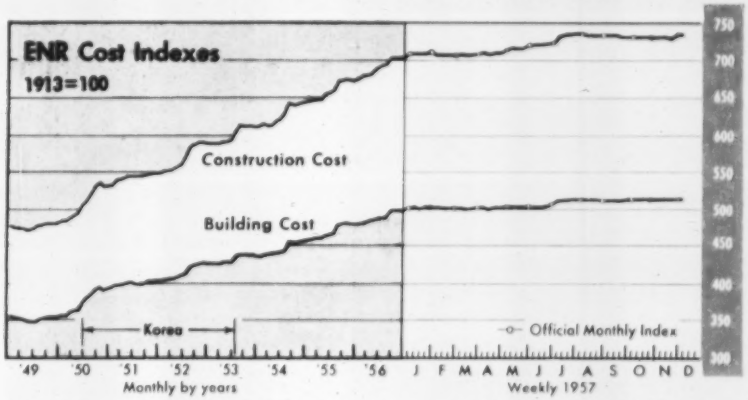
NEW CAPITAL FOR CONSTRUCTION

	Week of Dec. 5	Cum. 49 wks 1957	Chge '56-'57
Corporate Securities	$27.9	$5,591.0	+25
State and Municipal:			
All Except Housing	73.2	5,352.0	+24
Housing	...	155.8	+71
Federal Loans	...	186.4	+38
Federal Aid	...	2,161.2	+102
Total Nonfederal	$101.1	$13,446.5	+33
Federal Appropriations:			
In U. S.	...	$2,777.0	−20
Outside U. S.	...	29.0	+82
Total New Capital	$101.1	$16,252.5	+20

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of Dec. 5 1957	% Change from Nov. 7 1957	% Change from Dec. 6 1956
Construction Cost	737.95	+0.1	+4.6
Building Cost	517.40	+0.2	+3.4

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518



CONTRACTS AWARDED

	1957 Nov. (millions)	1957 11-Mos. (millions)	% Change from 1956 Nov.†	% Change from 1956 11-Mos.
Total U. S., ENR reported	$1,232	$17,019	−11	−15
Private	565	7,976	−28	−36
Public	667	9,043	+10	+18
State and Municipal	560	6,910	+9	+13
Federal	107	2,133	+13	+36
ENR Volume Index, 1913=100	457	532	−16	−21

NEW CONSTRUCTION CAPITAL

Total U. S.	$912.1	$16,151.4	+37	+20
State and Municipal Bond Sales	503.6	5,434.7	+31	+25
Corporate Security Sales	401.2	5,563.1	+44	+26
Federal Loans, Aid (nonfederal work)	6.9	2,347.6	+3	+95
Federal Appropriations (federal work)	0	2,806.0*		−19

* Includes funds for outside U. S. † Based on weekly average

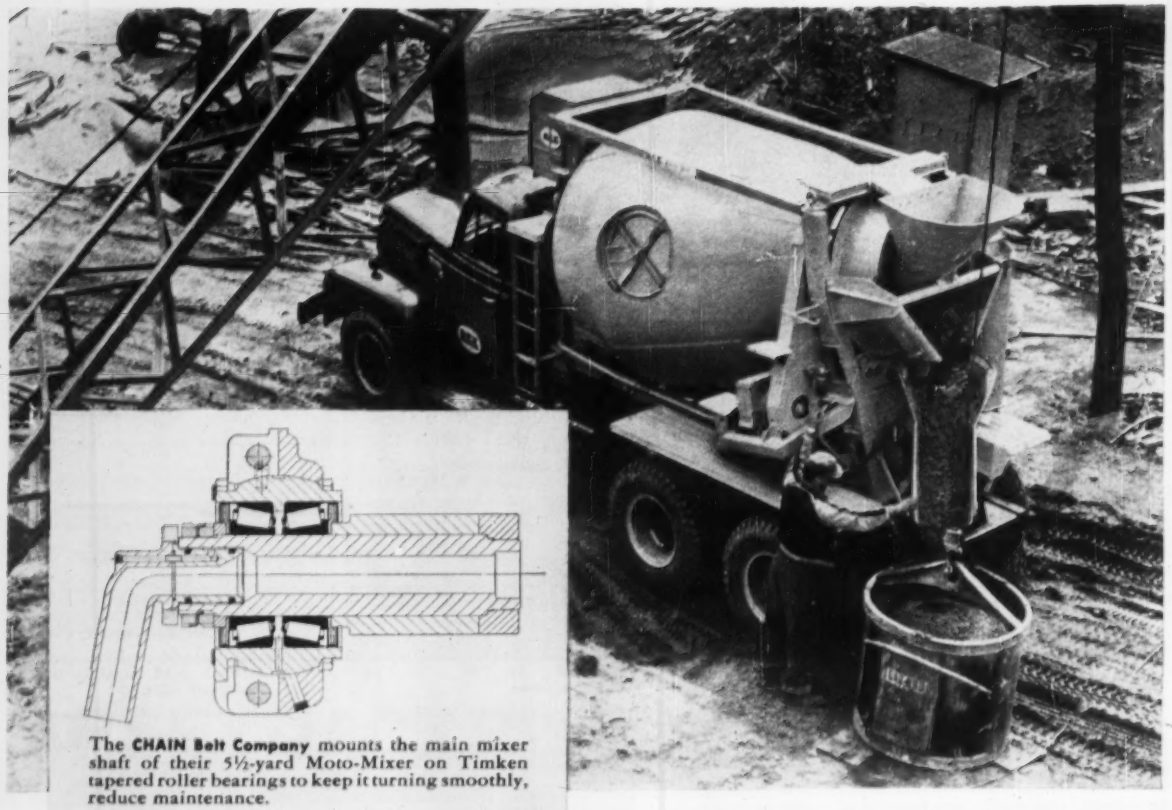
MATERIALS SHIPMENTS

	Unit	1957 Aug. (Ag) Sept. (S) Oct. (O)	Cum. (No. of Nos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur. Mines	thous bbls	30,884(S)	220,280(9)	+8	−7
Conc Paving Awards, PCA	thous sq yd	6,668(O)	78,347(10)	−9	+7
Fabricated Structural Steel	thous tons	331(O)	3,080(10)	+15	+17
Bookings, AISC	thous tons	177(O)	2,466(10)	−39	−25
Reinforcing Bars, Net, AISI	thous tons	182(S)	1,882(9)	−22	+6
Lumber, NLMA	mil fbm	3,091(O)	28,908(10)	−2	−7
Orders	mil fbm	3,001(O)	28,775(10)	−6	−7
Production	mil fbm	3,024(O)	28,787(10)	−11	−10
Douglas Fir Plywood, DFPA, 3/8" basis					
Production (aver per week)	mil sq ft	111.4(O)	104.0(10)	+4	+4
Orders (average per week)	mil sq ft	95.4(O)	103.5(10)	−23	+8
Clay Products, Bureau of Census					
Brick, Unglazed, Common, Face	mil bri	631.7(Ag)	4,066.6(8)	−2	−12
Vitrified Clay Sewer Pipe	thous tons	171.3(Ag)	1,121.4(8)	−9	−10
Structural Tile, Unglazed	thous tons	50.9(Ag)	407.0(8)	−20	−11
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	5,467(S)	41,203(9)	−2	−10
Asphalt Siding	thous sales sqs	115(S)	785(9)	−6	−10
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	75.7(S)	738.6(9)	−3	−10
Wire and Cable	mil lbs	21.7(S)	212.7(9)	−3	−8
Extruded Shapes (soft alloys)	mil lbs	54.6(S)	482.7(9)	+13	−0.4

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	3,287(S)	3,020(9)**	−2	+3
Contractor Failures, Dun & Bradstreet					
Number		176(O)	1,737(10)	−3	−17
Liabilities	thous	$7,994(O)	$91,179(10)	−28	−12

** Average per month



The **CHAIN Belt Company** mounts the main mixer shaft of their 5½-yard Moto-Mixer on Timken tapered roller bearings to keep it turning smoothly, reduce maintenance.

Larger payload without exceeding wheel load limits; mixing drum rolls on TIMKEN® bearings

THIS 5½-yard Rex Adjusta-Wate Moto-Mixer is designed with great attention to correct weight distribution. And Timken® bearings play a big role in the CHAIN Belt Company's claim of "More loads per truck per day—and larger payloads without exceeding wheel load limits". A huge part of the load is in the mixing drum itself where ruggedness counts. This drum is mounted entirely on Timken tapered roller bearings, front and back, for free rolling, longer wear, less maintenance.

The drum shaft is mounted on Timken bearings, too, preventing misalignments which would otherwise occur with the Rex Adjusta-Wate Moto-Mixer operating off-level or going over rough ground. The tapered construction of Timken bearings lets them take radial and thrust loads in any combination and Timken bearing rollers and races have full line contact, which means extra load-carrying capacity. What's more the severe shocks encountered are easily met by Timken bearing *case-carburized* rollers and races; hard, wear-resistant surfaces over tough, shock-resistant cores.

In addition, Rex Moto-Mixers also use Timken bearings to good advantage in the clutch drums, secondary shafts, and in the new, improved water pump—with the pump driven by a V-belt directly from the engine crankshafts. Timken bearings are geometrically designed to give true rolling motion, practically eliminating friction . . . precision-made to conform to their design. To insure highest quality, we even make our own steel, which no other American bearing manufacturer does.

Look for the trade-mark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD

TRADE-MARK REG. U. S. PAT. OFF.

Delaware Deficit Imperils Construction

State cancels highway bid openings; postpones sale of $20 million in school and roadbuilding bonds

Delaware has crashed headlong into a financial crisis that culminated last week with the calling of a special legislative session, the cancellation of at least three scheduled bid openings for highway construction and the postponement of about $20 million in construction bond sales.

The gravity of the situation was underlined when Gov. J. Caleb Boggs requested a ruling from State Attorney General Joseph Craven on whether Delaware has the right to "delay or postpone indefinitely" payment of operational expenses, including payrolls and pensions. The cash thus saved would cover debt service and repay short-term loans.

Adding to the furor was the announcement that four Delaware banks agreed to purchase up to $5 million in deficiency notes to cover the state's anticipated expenses this month and next. These notes would be piled on top of $7 million of similar debt incurred during October and November. The four banks that have agreed to the most recent purchase apparently are extremely unhappy about the situation for they set a maturity date of January 31, whereas the state had requested a 60 day maturity on note sales this month and next month.

None of these problems places the Delaware construction industry and taxpayers in an enviable position.

A budget cutting order from Governor Boggs to all state agencies that preceded the summoning of the legislature into special session brought some fast action. J. Gordon Smith, chairman of the State Highway Department told the governor that two months before the order he had cut the department's force of 1,000 by 10%.

Mr. Smith later announced that he had cancelled a bid opening scheduled for November 27, yesterday (December 11) and next Wednesday (December 18). The projects involved $1.5 million in highway work.

Then the state's bonding officers called a halt to further bond sales until such time as the legislature brings the budget into balance. Immediately jeopardized by this order is the sale of about $20 million in highway and school construction bonds that were to be sold in February or March.

Of the $20 million bond total, $10 million to $12 million would have financed highway construction with the balance going to school construction. A substantial share of the total would pay for the continuation of highway and school programs already started. Should the bonds fail to be offered, many programs under way would be stopped when existing funds obtained by earlier financing operations are expended.

Now the legislators are faced with the problem of balancing a budget that is badly out of kilter. According to the Permanent Budget Commission report submitted to the lawmakers at the start of last week's special session, the General Assemblies of 1955 and 1957 authorized $18 million more spending that was recommended by Governor Boggs for the four years ending June 30, 1959. Because of added debt service resulting from the past and imminent deficiency notes, along with other rising expenses, it is expected that by mid-1959, the deficit will be closer to $20 million.

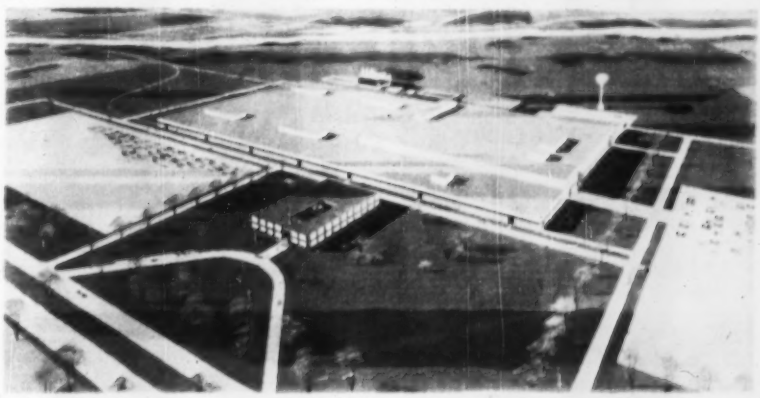
To balance the books, the legislature must choose between repealing appropriation bills—including some construction items—passed during the regular session, adding new taxes or increasing existing taxes.

In his message to the legislature, Governor Boggs asked that it consider "a moderate adjustment in personal income tax rates and the imposition of a moderate tax upon net profits of corporations conducting business in Delaware."

He said that these two taxes "are productive of relatively large amounts of revenue without delay and with comparative ease as to collection." The suggestion was also made that the legislature review the "adequacy under existing circumstances of present rates of all taxes and fees."

Neither did the governor consider unexpended appropriations as untouchable for he said that these should be reviewed and followed by such action as the group considers feasible and appropriate.

(*B&F continued on page 141*)



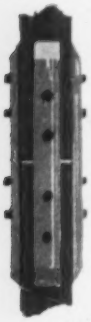
St. Louis May Get $15 Million Car Plant

Chrysler Corp. plans construction of a 1.3 million sq ft automobile assembly plant on U.S. Highway 66 near St. Louis if the site is rezoned for industrial use. Its construction cost is placed at $15 million.

Named as architectural engineer for design of the administration building is Sverdrup & Parcel of St. Louis. Albert Kahn Associated Architects and Engineers of Detroit has been awarded the architectural engineering contract for design of the assembly building, powerhouse and related manufacturing facilities. H. D. Tousley of Indianapolis is the general contractor.

The plant, scheduled for completion in 1959, will have a structural steel frame and precast concrete wall manufacturing building. The 65,000 sq ft administration building will be constructed of reinforced concrete.

"Trees jest don't grow long enough for this here job," grumbled Paul Bunyan to Babe, the Blue Ox. He was driving piles for his bridge across Lake Michigan. "Now if I could git me one o' them machines* the Baxter folks developed, Babe, I could splice me up a piling 900 feet long and get to the bottom o' this pesky pond."



BAXCO PRESSURE TREATED PILING *(spliced or unspliced!)*

* As a matter of fact, Paul, we *did* develop a pile-splicing machine—the only one of its kind in the world. It happened this way: engineers found that record length piling—160 feet long—would be required for the pier fender structure on the Richmond-San Rafael bridge in San Francisco. No such lengths existed. So what to do? So BAXCO engineers got busy with blades and motors and wheels—and came up with the answer...an efficient machine that spliced together 1448 of the longest pilings ever seen. And did the job in record time.

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Douglas fir piling from our own stands of West Coast timber...Creosote pressure treated to Federal and AWPA specifications.

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Baltimore Office Construction Soars

Award of $20.9 million contract brings 1951 total to $100 million; best year since pre-World War II

The recent awarding of a $20.9 million general contract to McCloskey & Co. for a new Federal Social Security office center climaxed the Baltimore metropolitan area's biggest single year for office building construction since before World War II. During 1957, office building projects completed or placed under contract have totaled about $100 million.

In addition, existing office space has been increased by nearly 4 million sq ft. Nearly 75% of the work, however, is for facilities to be used by either the federal or state governments.

Including elevator and moving-stair installations to be done under separate contracts, the new office center will cost more than $22 million. As headquarters for the Bureau of Old Age and Survivors Insurance, the center will provide space for about 7,300 federal employees now working in 12 different locations in Baltimore.

The largest of the structures will be a 10-story administration building. A four and five-story building will house the operations division. Linking these two structures will be a wing type unit 106 ft long and four stories high.

Other facilities at the center will include a cafeteria having a seating capacity of 1,200 persons, a 500 person auditorium and a library.

Because of the increasing use of electronic business machines, most of the floors in the office center will have movable walls so that room areas can be changed in size to accommodate new equipment. Two Baltimore architectural firms designed the center—Meyer & Ayers, and Fisher, Nes, Campbell & Associates.

• **Not the largest**—As large as the new federal office is, it is not the biggest office project this year in Baltimore. The National Security Administration's new building at Fort Meade, south of the city, is the largest.

Now completely occupied, this building cost approximately $35 million and contains 1.4 million sq ft of floor space. It is a three-story concrete and glass building.

The project is scheduled for completion in mid-1959.

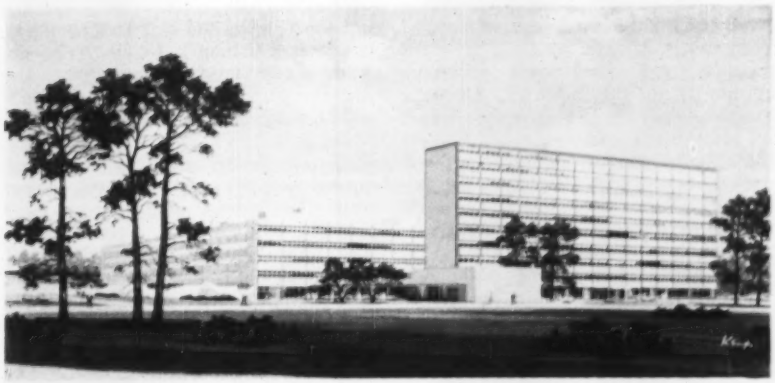
The national security building also has the longest corridor of any building in the nation, a distinction formerly claimed by the Capitol Building in Washington, D. C. The latter structure's corridor is 750 ft long, but the Fort Meade building contains one more than 950 ft long.

Office building dollar volume in the area was also swelled by the start of construction this year on an office center for the State of Maryland that will house the State Roads Commission and 47 other state agencies. This $14 million center will include a 15-story main building and a six-story building. The project is scheduled for completion in mid-1959.

• **Private buildings**—The largest privately owned office building erected in Baltimore in 25 years was completed in November for the Commercial Credit Corp. A 22-story structure, it cost $12 million and contains 235,000 sq ft of office space.

Under construction are a six-story building containing about 100,000 sq ft for Esso Standard Oil, a seven-story, 63,000 sq ft structure for Shell Oil Co. and a five-story building for a New York City investment group.

Several additions to buildings have been started and others also are planned. Typical among these is the Federal Reserve Bank where four floors were added at a cost of approximately $2 million.



OFFICE BUILDING BOOM this year in metropolitan Baltimore was climaxed by awarding of contract for this office center for the Federal Bureau of Old Age and Survivors Insurance. Architects are Meyer & Ayers, and Fisher, Nes, Campbell & Associates.

Redevelopment Near

Hartford gets $3 million offer from Webb & Knapp

Webb & Knapp Inc., New York real estate development company, made a firm offer of $3 million for an 11 acre tract in Hartford, Conn., the site of the city's first redevelopment project. The offer is $541,000 higher than the city's appraisal price.

Another New York City firm, Hegeman Harris Co., also has offered to buy the land, but at its appraised value of slightly more than $2.4 million. The Hartford Redevelopment Agency has taken both bids under consideration.

The agency also set December 16 as the deadline for the receipt of additional bids.

William Zeckendorf, head of Webb & Knapp, said his company plans the construction of a $35 million commercial area consisting of office buildings, retail stores and car parking facilities. In addition, the company expressed interest in the purchase of another three acre tract adjacent to the larger site, but which is not included in the pilot tract.

The $3 million purchase offer made by the firm for the 11 acres did not take in the smaller land area.

Webb & Knapp told the city its plans call for a three block parking arcade and plaza, a two story department store, a 30 story office building and also a governmental office structure. The entire area would be connected to the city's main shopping district by another enclosed arcade containing specialty type stores.

The Hegeman Harris company said it would construct a $26 million development to include two 16 story office buildings.

(B&F continued on page 142)

CHANNEL IMPROVEMENT at Torrington, Conn., is financed by up to $400,000 of federal funds that were available for expenditure by the Army Engineers without specific and time-consuming authorization by Congress.

City Speeds Flood Control

Torrington takes advantage of revised statute that provides up to $400,000 without action by Congress

One phase of the nation's flood-control legislation is getting a practical workout in Torrington, Conn., a flood-ravaged community now in the process of protecting itself from further devastation. A tool being employed is the revitalized, quick-action program provided under the Bush-McCormack Act, which provides funds without the need of Congressional approval.

The original program came into being with the Flood Control Act of 1948, but the relatively small amount of funds at first authorized proved to be comparatively ineffectual.

The legislation authorized $2 million annually for small, local flood protection projects each to cost no more than $100,000. The funds, supplied by the federal government, could be released by the Army Engineers without specific Congressional action. The Corps also selects and approves the site.

In addition to being feasible and having a favorable benefit-cost ratio, each project must be complete in itself with the community benefiting to supply the land and other services just as it would for a Congressionally approved job.

In 1950, Congress raised the authorization to $3 million and the project-cost limitation to $150,000, but again activity was negligible. Six years later, the so-called Bush-McCormack Act boosted the authorization ante to $10 million and the job-cost ceiling to $400,000. The same law also eliminated a former restriction that the small projects could not be completed in areas intended to be protected by Congressionally authorized programs.

• **Quick results**—Last year's legislation apparently turned the trick, for with the individual project allowance hiked to $400,000 Torrington moved in on the opportunity and with the required backing of the Chief of Engineers, became the first community in the U.S. to obtain a federal construction appropriation under the 1956 act.

According to the Army Engineers, the new $400,000 ceiling has made eligible for the program many additional projects. The branch reports that there are many justified projects of this size where the local economy—and even lives—have been jeopardized by the unavoidable delay that is encountered when formal Congressional authorization procedures are required.

This year, Congress voted $3.5 million for the small project fund. With this amount added to a carryover of about $1.5 million from the 1957 fiscal year, the Corps has a $5 million kitty available for allotment during the current fiscal year.

• **What the current job is**—In Torrington, where six times in 30 years floods have slammed through the community's core, the Naugatuck River and its tributary channels are being deepened and widened for a total distance of 9,000 ft at a cost slightly under the $400,000 ceiling.

Bottom width of the channel will be 130 ft with rock-faced dikes providing 3 ft of freeboard above the design flood. Dikes will have a top width of 10 ft and wide 2 to 1 slopes.

Channel improvement continues up a tributary of the Naugatuck where the new channel bottom widths will be 30 ft and 50 ft at various points.

The current work, scheduled for completion before the spring snowmelt, is part of an overall protection plan for the city which was last deluged in August 1955. Small reservoirs are contemplated on the east and west branches of the Naugatuck River, which join at Torrington. In addition to supplying the land for the project, the community is responsible for all necessary bridge and utility alterations and relocations.

Oneglia & Gervasini, Torrington, is carrying out the project under the direction of the Corps' New England Division, headed by Brig. Gen. Alden K. Sibley.

Court Upholds Validity Of Bond Sales Below Par

The County Circuit Court at Jefferson City, Mo., has upheld the right of the state's Board of Fund Commissioners to offer and sell state building bonds at less than par value. The decision is expected to be appealed to the Missouri Supreme Court.

The court action resulted from legislation passed by a special session of the legislature that removed the restriction against selling building bonds below par. The special session was called after the state failed to receive any bids on $30 million in 3% bonds (ENR Oct. 3, p. 104). The 3% interest rate is a maximum and is fixed by the state constitution. The par stipulation was statutory and therefore open to change by the state's law-making body. The two restrictions, in a period of tight money, had made the bond issue unattractive to investors.

Attracting Industry Is a Big Business

States work hard and spend big money to win new plants; construction and regions grow as result

The rapid growth of population and the increasing costs of providing services for that population have forced states and local governments to step up their drive for new industry. Only with a broad tax base and the income received from industry and commerce, can local governments meet the urgent demands for water and sanitary systems, schools, recreation facilities and other community facilities. To obtain new industry, the states and cities use bait varying from direct financial aid to selling vacationing industrial executives on the idea of constructing plants where an enjoyable vacation has been passed.

Where such measures work, employment and tax revenues grow, and in the process the construction industry has thrived.

A vigorous drive began in Memphis, Tenn., with formation of the Memphis Industrial Development Committee. The first step proposed is a national advertising campaign to tell the country about the industrial opportunities of Greater Memphis. Local businessmen also will be asked to visit good industrial prospects and promote the area.

New industry in Greater Memphis will bring new housing needs as well, David Harsh, a county commissioner, pointed out recently to Memphis realtors. Housing units in the county, which includes Memphis, will jump from 175,000 today to " between 350,000 and half a million by 1975 or 1980," he said.

Another promising start has been made in Arkansas, where businessmen have put up $100,000 and founded the Arkansas Development Finance Corp. (ENR July 25, p. 130). Utilities are being asked to contribute $900,000 for additional capitalization, after which th nonprofit firm will be able to issue $10 million in bonds. The state will be permitted to buy $5 million of the bonds and match private funds for any remainder. The money raised will be used to construct plants and purchase sites for new or expanding industries.

• **Florida advertises**—In Florida, the State Development Commission is planning a giant $1.2 million advertising program to attract more industry and tourists. Two consulting firms also have been retained to study the state's industrially underdeveloped areas and recommend action for the commission and the state to take.

Kentucky also is working aggressively to woo industry. Although regional planning is not a new idea in Kentucky, for the first time a group has been appointed to take concrete action. The nine-member Regional Planning Commission, formed partly as a result of the disastrous floods last January, will attack the twin problems of flood relief and economic development in cooperation with a citizens' group from the eastern part of the state. The commission's first work will be in the depressed eastern counties. If the efforts prove effective, commission activities will be broadened to include other parts of the state.

"What we would like to see is an industry in every county seat," declared Lieut. Gov. Harry L. Waterfield.

Possible projects for the commission include:

- Assisting communities in obtaining federal help for urban renewal, low-rent housing, and construction of public facilities.
- A study of state legislation needed for county and intercounty planning.
- A study of potential industrial sites and needed improvements.
- A study of the area's tourist potential.

Commission members serve without pay, but it is hoped that the 1958 state budget will provide for a paid technical staff.

In the meantime, the state's Economic Development Department reports that good teamwork between private firms and public agencies is bringing many new firms into the state. "Some 50% or more of firms that sent representatives to Kentucky to make plant location surveys followed through by building in the state," according to John C. Rogers of the Economic Development Department. Mr. Rogers, writing in a state publication, reported that this compares with a national average of 10%, based on recent surveys. The department keeps an active file of 330 suitable industrial tracts ranging in size from four to 1,000 acres, and this information can be obtained on short notice by companies requesting it.

• **Maryland acts**—Baltimore County's bid for more industry is slated to pick up in 1958 with the formation of a Department of Trade. Maryland's fast-growing population must be offset by more industry to provide revenue for more public services, county officials say.

"We've got places to put industry," one declared, "but the job is to go and get them in here."

At first the new county department will be a one-man public relations job to sell the area to industry. A "starter" appropriation of $50,000 has been requested.

More promotion for industry and an advertising campaign was urged for Michigan by the public relations advisory committee of the State Economic Development Department. Edwin O. George, committee chairman and a Detroit utility executive, revealed that Michigan's publicity expenditures were the smallest of 20 states surveyed. Michigan's outlay for 1957 of $57,450 compared with more than $400,000 spent by Louisiana and Pennsylvania. The state's economic development group has recommended a $200,000 expenditure in its budget request for the next fiscal year.

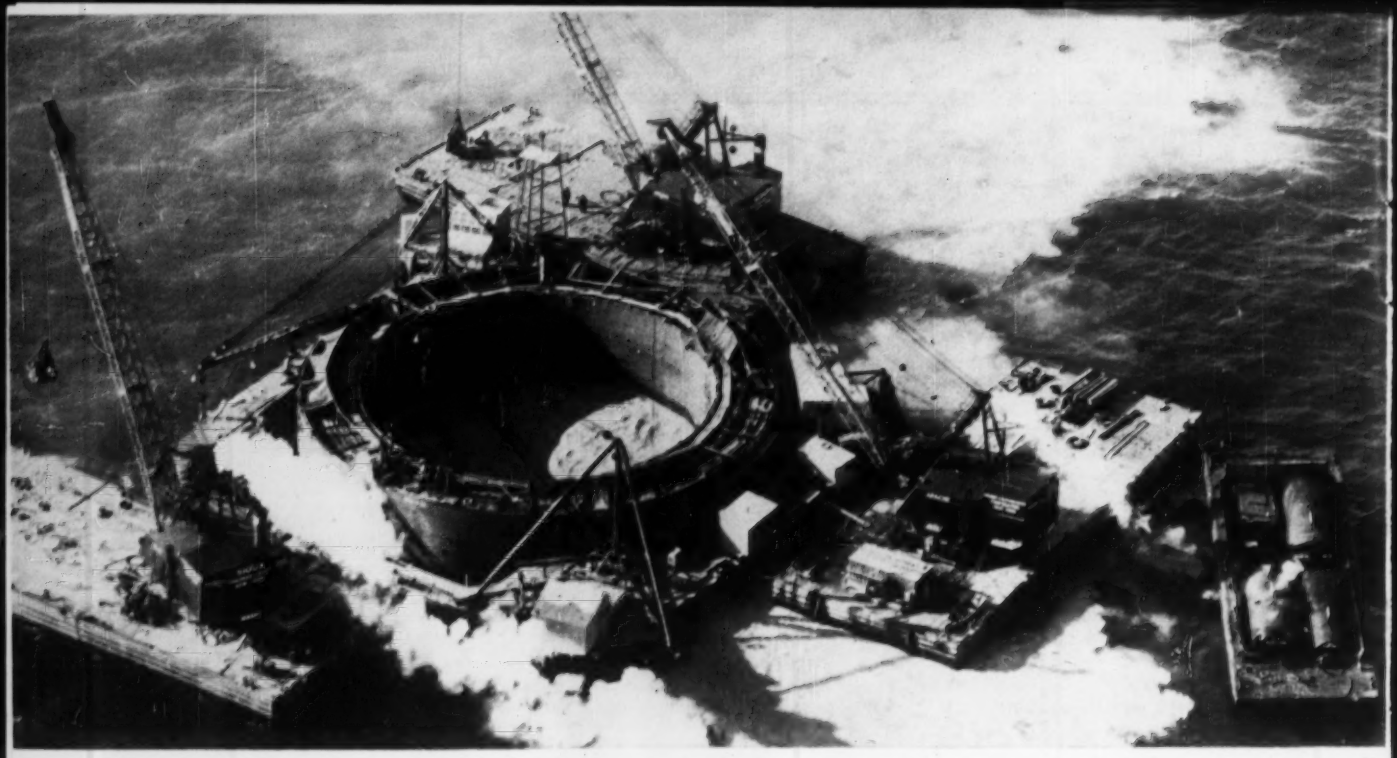
Dan McGowan, member of the commission, told recently of a novel tourist-screening conducted by local Chambers of Commerce. When industrial executives are found among vacationers, they are approached and urged to consider the area as a site for their companies' future expansion.

More industries are finding it advantageous to locate plants near the recreational areas where both management and employees can enjoy their leisure time, Mr. McGowan explained.

The value of personal persuasion outside state lines also is appreciated by Michigan's industrial development officials. The state recently appointed 200 "economic ambassadors" to promote it as a location for industry on their travels in other states. The men are leaders in business, labor, agriculture, education, the professions and government, whose work ordinarily brings them into contact with men on the same level in other areas.

• **Make friends**—Personal contact sometimes pays off in the long run, as Baton Rouge, La., officials found when they unsuccessfully sought an industry for their city in 1952. The story was told by Theodore T. Miller, president of W. R. Grace & Co.'s polymer chemicals division.

In 1952, Grace decided to build a



"Construction Daily informs us of new bid invitations"

Says Merritt-Chapman & Scott

Foundation for 552-foot Mackinac Bridge tower was one of 34 piers built by Merritt-Chapman & Scott under a $25,735,600 substructure contract for the world's longest suspension bridge. In 1956, MC&S did a construction volume of $140 million. The company's current construction backlog is $290 million.

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Founded in 1860, the company also operates in the fields of chemicals, paint and metallurgical products; shipbuilding and industrial equipment; and steel production. Main offices are in New York City.

new ammonia and urea plant. After the announcement, Baton Rouge officials got on the phone to New York and asked the company to listen to their argument for locating the plant in Baton Rouge. Told that land had already been purchased in another state, they persisted, arranged an audience and a week later laid maps and statistics before Grace's top management. Nothing came of it, but 3½ years later Grace decided to build another plant, and this time it was located in Baton Rouge.

The long-range, constructive salesmanship of Baton Rouge officials has been paying off, Mr. Miller said, and "over $250 million of new chemical plant construction has been announced in the area in the past two years."

Maine's drive for more industry got a boost recently when the legislature approved a state mortgage insurance plan for new industrial plants (ENR Nov. 21, p. 107). The legislation set up a Maine Industrial Building Authority to work with local nonprofit corporations to insure conventional mortgages for construction of plants. Companies desiring this backing for their mortgages must be screened by the local corporation. But when approved, the theory runs, the companies will be able to secure mortgages more quickly and on better terms.

Maine's need for development plans was underlined recently by Fred A. Clough, State Development Commissioner. Though 14 new industries employing 700 persons had been added during the past year, and another 700 jobs appeared because of expansions, the state lost 5,600 jobs in the same period.

• **Pennsylvania's mortgage plan**—Philadelphia mounted an attack on its industrial land shortage recently with the establishment of an industrial land "bank" (ENR Nov. 21, p. 107). The city has already "deposited" 113 acres adjoining the North Philadelphia Airport with the Redevelopment Authority. The authority can clear the land, then lease or sell it to industry. Revenue is used for purchase and clearing of other blighted industrial areas. The city estimates it has 1,200 acres available for industrial use and hopes to develop 300 acres a year.

On the state level the Pennsylvania Industrial Development Authority has built a successful record in its first year or so of operation. The authority finances second mortgages for new industrial plants in labor surplus areas. It now reports having recruited 26 new industries with this program.

The authority advanced $4 million in second mortgage loans at interest rates of 3% or less. Like the main authority, the PIDA works with local nonprofit agencies. The agency puts up at least 20% of the money, conventional lenders must be found to provide 50% in the form of a first mortgage loan, and the state supplies the remainder. Plants are leased on attractive terms, and liquidation is usually spaced over 20 years.

The biggest "catch" so far for the PIDA was Eberhard Faber Pencil Co., whose $2.4 million plant near Wilkes-Barre was arranged with state and local agency support. The company moved from five buildings in Brooklyn, N. Y., after finding the Pennsylvania site desirable and the financing arrangement irresistible. The PIDA contribution for a second mortgage was $720,000.

The $4 million spent by the PIDA has brought construction projects into being totaling many millions of dollars a year.

• **Money provided**—Wisconsin has a $100,000 fund to pay for state industrial advertising. In another move, Wisconsin businessmen met at Madison and pledged $25,000 in stock purchases to revive the Wisconsin Development Corp. The corporation was authorized in 1955 by the state legislature but has been inactive because it lacked funds. The $25,000 will enable it to borrow another $250,000 to lend to companies unable to obtain conventional financing for plant construction.

The advisory council for Washington State's new Department of Commerce and Economic Development has been completed.

Dresser, Gardner-Denver Cancel Plans for Merger

Plans have been dropped for the merger of Dresser Industries, Inc., of Dallas and Gardner-Denver Co. of Quincy, Ill.

Under a recently announced acquisition agreement Dresser would have taken over Gardner-Denver and combined it with four Dresser subsidiaries to form one wholly-owned unit to be known as Gardner-Dresser Co. (ENR Nov. 14, p. 148). The transaction was to have been effected through an exchange of stock.

H. N. Mallon, Dresser chairman, said merger plans were terminated because of a difference in management philosophies of the two companies.

Dresser manufactures equipment for the oil, gas and chemical industries. Gardner-Denver produces compressors, pumps, rock drills and air tools.

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LABOR SECRETARY James P. Mitchell (center) is greeted by AFL-CIO President George Meany and Vice President Walter Reuther as he arrives at the federation's Atlantic City convention to present . . .

The Proposals to Curb Union Abuses

U. S. Secretary of Labor James P. Mitchell last week presented a series of comprehensive legislative proposals to curb union abuses and to protect "the integrity of the American labor movement."

The proposals embrace amendments to the Taft-Hartley Act, changes in other laws and the passage of new laws. They range from stringent controls over union funds and activities, including boycotts and organizational picketing, to elimination of the jurisdictional no-man's land between state courts and the National Labor Relations Board. Several are aimed specifically at the construction industry.

The recommendations will be presented to Congress by President Eisenhower in his State of the Union Message in January. Preview of the proposals occurred at the AFL-CIO's second convention now in session in Atlantic City, N. J. (see page 21).

Labor's reaction was one of mixed emotions. Though not as harsh as labor had feared, the proposals appear to contain—as Fred Hartley once said about the Taft-Hartley Act—"more than meets the eye."

• **Construction**—Proposals directly affecting the construction industry call for authorization of pre-hire labor contracts, approval of contractor contributions for apprentice training, and legislation of certain types of secondary boycotts at construction sites where the status of any employer as an innocent third party is considered tenuous at best.

The first two recommendations were made earlier this year by the construction industry's Joint Advisory Committee on Taft-Hartley Act amendments (ENR Mar. 28, p. 174). The third one has long been urged by the AFL-CIO Building and Construction Trades Department and would free the building trades from the picketing restrictions imposed by the U. S. Supreme Court in the Denver Building Trades case.

Of equal importance is another proposal broadening the definition of secondary boycott activity to include union coercion of employers to induce them to stop doing business with others.

This proposal would effectively remove the only avenue left to unions by the courts for the implementation of hot cargo clauses, which are frequently used by the building trades to discourage use of construction materials and equipment produced by companies they consider unfair.

It would also clamp down on union efforts to protect their interests through the types of activity recently directed at the Burt Manufacturing and Kohler Companies as well as that used by the plumbers when they refused to handle prefabricated Westinghouse pipe for installation by United Engineers and Constructors at Detroit Edison's River Rouge plant.

• **Union busting**—Despite these far reaching implications, the Administration proposals are said to be based on the propositions that the trade union movement should be strengthened rather than weakened and that the absence of government domination is essential to sound labor-management relations.

Secretary Mitchell specifically repudiated an extension of the anti-trust laws to organized labor and said that the Administration will resist any attempt to enact a national right-to-work law banning the union shop. He omitted

any reference to repeal of the present provision that authorizes such laws (there are now 18) at the state level.

By promising that the Administration "will vigorously oppose any legislation designed to bust unions," he sought to allay to some extent one of labor's biggest fears as a result of the current Senate investigations—an onslaught of punitive and repressive legislation enacted under the guise of preventing corrupt employers and union officials from preying on the legitimate interests of employees.

• **Union controls**—The most detailed proposals seek to assure proper application of union and nonunion funds existing for the benefit of employees, to promote the principles of democracy in trade union affairs and to reduce collusion between employer and labor representatives. These goals would be achieved by:

- Public disclosure of the operations of employee health, welfare and pension plans, including (as labor requested) those unilaterally administered by employers as well as those under union or joint labor-management control.
- Union filing of annual reports on their financial and internal affairs.
- Secret ballot elections of local, national and international union officers.
- Annual union and employer reports on financial transactions with each other.
- A ban on employer efforts to influence by bribery the unionization of employees.

Secretary Mitchell said the proposals "will not inject the government needlessly into the internal affairs of labor and management." But Washington attorney Louis Sherman last week told the building trades at their convention that statutes relating to union discipline and elections are an invasion of internal affairs and could lead to "Peron-type unionism." A secret ballot, he said, would destroy the accountability of delegates to their constituents and is as unpalatable as a secret ballot system for senators and congressmen on legislative issues.

• **Other changes**—Included in other proposals are restrictions on organizational picketing to prevent labor groups from forcing employees to join unions not of their choice.

"Where it is clear that the employees of the employer do not desire a union as their bargaining representative," Secretary Mitchell said, "the use of a picket line to force that union upon an employer and his employees should be restricted."

Elsewhere, the proposals would prevent a union from forcing an employer to bargain during the life of a contract unless the contract contains a reopening clause or the parties agree to reopen it. Presumably this would virtually ban all strikes over wages and working conditions before the expiration of a contract.

The non-Communist affidavit now required by the Taft-Hartley Act would be eliminated by the Administration, and economic strikers would no longer be denied the right to vote in representation elections.

The doctrine of federal supremacy would be modified to allow state courts to take jurisdiction over labor matters covered by federal law whenever the NLRB has refused to act. Courts have held that the federal government has retained exclusive jurisdiction over labor disputes covered by the Taft-Hartley Act. In many instances, labor and management have not been able to obtain relief because the labor board, under the jurisdictional yardsticks it has established, has refused to hear them. Last May, the Associated General Contractors of America called for removal of this dilemma.

Secretary Mitchell called the program he presented "no cure-all" for the problems that presently exist. But he expressed the hope it would help "the labor movement to regain the high position it deserves in the hearts and minds of the American people."

AGC'S JAMES MARSHALL, shaking hands with Building Trades Department Secretary Frank Bonadio, was a guest speaker at the building trades' Atlantic City convention.

AGC, NAHB Call for Action on Wage Freeze

The Associated General Contractors of America and the National Association of Home Builders have urged AFL-CIO construction union leaders to adopt a wage freeze proposal presented last week by Richard J. Gray, president of the AFL-CIO Building and Construction Trades Department.

Mr. Gray proposed, as a means of combating inflation, that the general presidents of the 19 international building trades unions join in a public dec-

laration of policy calling upon all local building and construction trades unions to voluntarily forego wage increases during 1958 (see page 21).

In a statement directed at the proposal, James D. Marshall, executive director of AGC, said that construction employers "naturally would be encouraged by a statesmanlike approach" to the problem of inflation and its effect on the construction industry.

"The association will study carefully," he said, "with a view toward possible cooperation, any concrete move for a sound policy in meeting problems faced by the construction industry and the national economy."

Earlier, NAHB, through its President George S. Goodyear, invited the building trades unions to present a specific anti-inflation program for joint union-management consideration.

In presenting his proposal, President Gray, who is a staunch advocate of free enterprise, said that inflation creates a shortage of money and causes cutbacks in construction and unemployment. He suggested the time has come for "stabilizing our wage gains and obtaining full employment through increased construction."

The proposal runs counter to the AFL-CIO economic philosophy that current inflation stems from pricing rather than wage policies and that an expanding purchasing power is essential to national prosperity. It was immediately condemned by AFL-CIO President Meany, who said employers would be the only group to benefit.

Workers on School Job Get Back Pay Windfall

As a result of the New York State prevailing wage law, 29 construction workers on a $150,000 school project have received $8,011.57 in back wages.

In remodeling a building for school purposes, the Shelburne, N. Y. Board of Education of Shelburne Central School had acted as its own contractor in order to keep costs down. It hired a general superintendent, who, in turn, hired local building tradesmen to do the work. Wages paid ranged from 12½ to $1.85 an hour below the prevailing rates as determined by the Department of Labor's Division of Public Works.

Under the law, construction workers paid with public funds must receive rates prevailing in that area for similar work done under private contracts. When the matter was investigated, the board took corrective action. A spokesman for the State Department of Labor said the board was under "a misapprehension as to the law's provisions and coverage."

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: January 7, 1958

Contract NYA-930.004

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
EXPANSION OF BULK FUEL FACILITIES

Sealed proposals for the construction of foundations, a fueling pier, piping, paving and other facilities for the expansion of bulk fuel facilities at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, New York, until 2:30 P.M. on Tuesday, January 7, 1958, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The recipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 12, 1957

Bids: December 27, 1957

Contract O & M-461

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
BUILDING 137
MEZZANINE OFFICES

Sealed proposals for furnishing all labor, material and equipment for the construction of a new mezzanine floor together with offices thereon, in Building 137 at Port Newark, New Jersey, will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 o'clock A.M. (EST) on Friday, December 27, 1957, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, December 12, 1957

Bids: February 5, 1958.

The Pennsylvania Railroad Company Contract No. 2—Alterations to Superstructure of Delair Bridge No. 2.07 over Delaware River, Philadelphia, Pa.

Notice to Contractors:

Sealed proposals for the alteration to the Superstructure of the railroad bridge between Philadelphia, Pa. and Delair, N. J., will be received at the office of the Assistant Chief Engineer-Construction, Room 1640 Transportation Center, Number Six Penn Center Plaza, Philadelphia 4, Pa., until 2:00 P. M., February 5, 1958 at which time said proposals will be opened and publicly read.

Contract documents may be seen at the above mentioned office on and after December 11th, 1957. Documents will be furnished upon deposit of $100.00 per set for not more than three sets to any one company. Deposit is returnable only to bidders who return the documents in good order within one week after the opening of proposals.

THE PENNSYLVANIA RAILROAD COMPANY
J. F. Piper
Assistant Chief Engineer-Construction

Bids: March 3, 1958

Government of Iraq Electrification of Basrah Power Project Contract No. 14 Cabling (up to 33 KV), Lighting and Accessories

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply and delivery, erection and supervision of operation, of Cabling (up to 33 KV), Lighting and Accessories for Basrah Power Station.

Full information regarding this tender can be obtained on and after November 25, 1957 from Embassy of Iraq, Washington, or Messrs. Ewbank and Partners, 10/11 Grosvenor Place, London S.W.1., England.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time on March 3, 1958.

Act. Minister of Development

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P. O. Box 12, N. Y. 36. December 26th issue closes December 16th

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Superintendent experienced in heavy sewer & water main construction under difficult conditions, by N. Y. State Contractor. Permanent position for qualified, responsible person looking for advancement with established firm. P-6165, Engineering News-Record.

Heavy contractor, N. Y. State, needs man to assume charge of take off, purchasing, engineering, expediting. Requires sound background & responsible field experience in heavier water, sewer & treatment plant work. Excellent opportunity for qualified person seeking & able to advance. Reply to P. O. Box 147, Colvin Station, Syracuse, N. Y.

Experienced Estimator—General Contractor, commercial, industrial, civic and school construction, $100,000 and over, New Hampshire Civil Engineer or equivalent. Send resume of education, experience and salary required to P-6722, Engineering News-Record.

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Frequently, when there are many applicants for a position, only the most promising letters are acknowledged. The other applicants never know whether their letters reached a prospective employer or not. These men often become discouraged, will not respond to future advertisements and even question their bona fide character.

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Construction Manager, preferably in 40's and with overseas experience, for concrete housing construction in Middle East. Duration approximately three (3) years. American firm. Tact and ability negotiate, organize and supervise essential. Salary open. P-6741, Engineering News-Record.

Senior Soils and Materials Engineer—Foreign —Minimum 6 years experience in highway construction materials survey and testing. Must be able to take responsible charge of field laboratory and testing operations. Near East Country. Minimum 2 year contract. P-6733, Engineering News-Record.

Chief of Surveys—Location Engineer—Foreign—Minimum 8 years experience in highway and bridge location surveys with at least 2 years in responsible charge of survey work. Must have good knowledge of highway location operations—Near East Country. Minimum 2 year contract. P-6738, Engineering News-Record.

Estimator, for quantity survey, recaps, job analysis, some pricing in General Construction. Engineering and/or field experience desirable. Send resume, state age and salary range. R. S. Noonan, Inc., 26 North Duke Street, York, Pennsylvania.

Wanted—Engineers and Draftsmen experienced in design and preparation of plans for sanitary sewers, sewage treatment works, water mains, water treatment plants. State age, education, experience, salary and when can report. P-6804, Engineering News-Record.

Civil Engineer, major in soil mechanics and foundation engineering, to assist in writing reports and supervise laboratory work. Opportunity for advancement with young growing firm in southwest. Furnish full particulars regarding education and experience as well as salary required. P-6803, Engineering News-Record.

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Structural Engineer BS, MS in CE, age 35, bridge design experience with internationally known U. S. consulting firms, available for either western U. S. or preferably foreign assignment after January 1958. Familiar with structural design of hydraulic structures. PW-6676, Engineering News-Record.

Paving Engineer BSCE, MSCE with 20 years experience, single, desires position for overseas or local airport or highway projects. Resume and references available upon request. PW-6734, Engineering News-Record.

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Manager or General Superintendent. Age 42, 26 years experience in all types of pile foundations, land and water cofferdams, bulkheads, piers and docks, underpinning, heavy timber and concrete construction and underwater work. Prefer to work out of the country. Presently general mgr. of above type of work. Available after 1st of year. Best of references. PW-6758, Engineering News-Record.

Construction Executive, 42, twenty years experience. All phases Industrial, Commercial, Institutional, Military, Shipyard, and Heavy Construction. Bids to completion. Graduate Civil and Structural Engineer. Certificate in Mechanical Engineering and Naval Architecture. General Construction Management; Contract Negotiation; Supervision; Public and Labor Relations; Cost analysis; Estimating and Quantity Survey. Desire permanent connection with possible future participation. Central New Jersey or Eastern Pennsylvania. Minimum $15,000.00 Available after January 1, 1958. Certain Key personnel available with me. PW-6689, Engineering News-Record.

Mech Engineer, 16 years construction experience on refineries, air bases, power plants, industrial buildings, and private construction. Stateside and foreign seeks position with contractor or engineer. Prefer foreign. Available Jan 15. PW-6806, Engineering News-Record.

Civil Engineer with Commercial Pilot and Instrument Rating desires position as Pilot-Engineer or Pilot-Sales Engineer. College grad., age 31, married, 8 years with Public Works Department in Eastern State. Last 2 years as Right of Way Engineer with remainder in highway design and resident engineer. Will relocate. PW-6766, Engineering News-Record.

Civil Eng. 27. Exp. survey, inspection, struct. design, contractor's office eng. desires pos. with eng. firm or contractor. PW-6778, Engineering News-Record.

General Manager for General Contracting Firm with an annual volume or potential of 5 to 15 million dollars in buildings, disposal plants, highway structures, etc. Broad experience in production, engine ring and business phases of construction management. Age 43. Prefer Western location. Detailed portfolio on request. PW-6805, Engineering News-Record.

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Hydraulic Engineer: Experienced in water management, rates, design, sewer design and maintenance, desires to relocate in Florida with private water company or well developer. PW-6802, Engineering News-Record.

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Construction Methods and Equipment
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P-6428, Engineering News-Record
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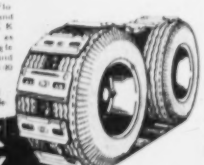

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Opportunity Missed

THE COMMITTEE APPOINTED BY THE GOVERNOR of Michigan to investigate the collapse on Oct. 3, 1956, of the Consumers Power Co. building under construction at Jackson, Mich., was presented with an excellent opportunity to serve both the general public and the engineering profession—and it muffed it in the report it submitted late last month after a year's study.

The governor's directive was "to evaluate the reasons for the disaster and to make appropriate recommendations for the prevention of future tragedies of this kind." The report substantially ignores this directive and is so vague in its findings as to be virtually useless.

The failure, in which ten men were killed, occurred in a wing that was of flat-plate construction. The flat-plate floors were 10 in. thick, and the columns were 20 to 25 in. square. Along two sides of some interior columns 10 x 14 in. openings were provided for ducts and piping. How shear was to be transferred from slab to columns is still not known. Concrete was being placed in the forms for the fourth floor when, without warning, a section three bays wide by six bays long dropped into the basement (ENR Oct. 11, 1956, p. 24). Some of the columns remained standing.

Governor Williams promptly appointed the investigating committee, which inspected the site, examined drawings and specifications, took testimony and reviewed reports made by consulting firms to the architect and the owner. These reports, the governor said, called the concrete "substandard" and enumerated various design and construction defects. Yet, the official committee report, a public document, merely states that:

"The committee attributes the collapse of the building to 'human failure.' From a technical standpoint, no single factor can be pinpointed as the proximate cause of failure. The committee questions various aspects of the design, construction, and supervision of this building project and the owner's participation therein."

The report goes on to recommend that professional societies and labor organizations raise the technical knowledge of their membership. It also says the committee "considered" the desirability of establishing adequate building and safety codes throughout the state. But nowhere does it shed light on the nature of the "human failure" responsible for the collapse or of the "design construction and supervision" aspects which the committee found questionable.

How can such a report prevent future tragedies of a similar nature?

The committee failed to discharge its duties both to the public and to the engineering profession. It has also been unfair to the designers and the contractor by issuing broad accusations, to which they cannot reply without knowledge of the specifics. In view of the wealth of information made available to the committee, and of the knowledge of design and construction defects it implies it possesses, the governor now should ask the committee to disclose frankly what has been learned about the causes of the collapse. The opportunity to learn from this costly lesson should not be missed.

Shippingport "Fires Up"

THE START-UP LAST WEEK in Shippingport, Pa., of the first U.S. reactor meant to produce commercial electric power could hardly have been better timed.

Appropriately, the Shippingport reactor went "critical" 15 years to the day after Enrico Fermi and crew achieved the first self-sustained atomic chain reaction in Chicago. But far more important is the fact that the nation's first civilian nuclear power station starts up (it will be on the line in January) at a time when some are questioning the future of nuclear power in the U. S.

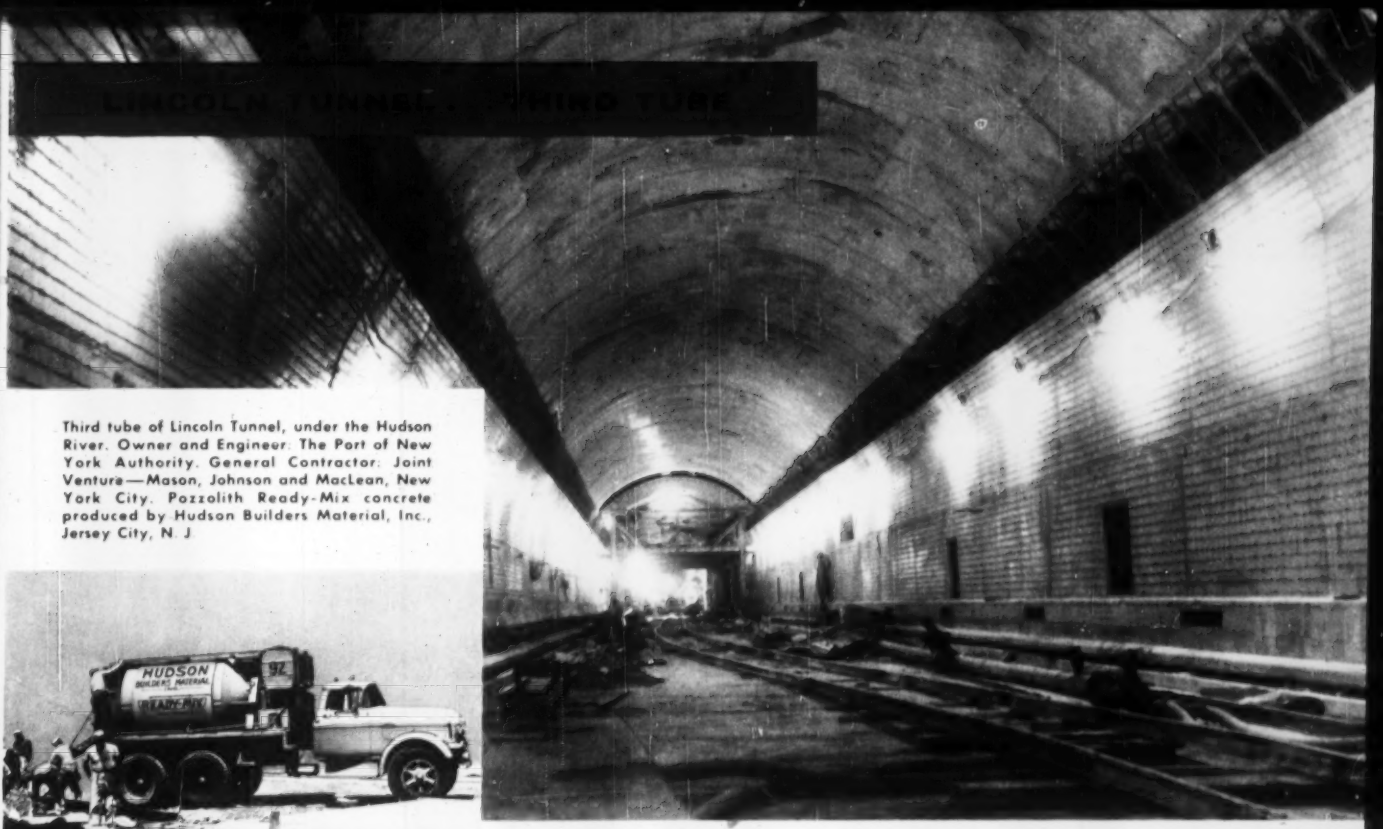
In the last few months, some firms that had entered the field with great hopes began withdrawing or curtailing their activities. This stemmed in large measure from the continuous upward revision of estimated nuclear plant construction costs, thereby farther putting off the day when nuclear power would be competitive in the U. S.—the day when the nuclear construction boom will begin.

Few responsible persons had predicted that the boom time was any closer than 1965, and most were, and are now, saying 1975. Yet in the last few years, many companies geared up for an early start. [It's a situation much like the current misreading of the highway program by some manufacturers and contractors (ENR Nov. 21, p. 19).]

Now the historic event at Shippingport serves to place the A-power business in proper perspective. This nuclear power plant, and the 15 or so others under way, are simply prototypes being constructed to develop a reactor type that can cope with U. S. economic conditions. The power industry in the past has found that actual operating experience is the chief means of evolving a competitive product.

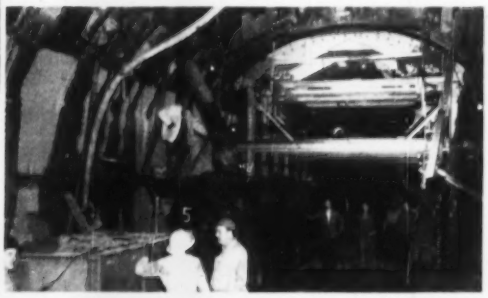
The construction industry's interest in the advent of large-scale nuclear power building is simple. All signs point to nuclear power plants being high in capital cost and low in operating costs, somewhat akin to hydroelectric stations. Compared with conventionally fueled steam plants, this means more dollars to the construction industry and to equipment makers and a new field of activity for both of them. It also means that the nation's limited supply of coal, oil and gas will go farther.

So, for the benefit of the nation and, happily, of the construction industry, it is to be hoped that last week's "burning" of nuclear fuel at Shippingport will re-focus the nuclear industry's efforts on developing a suitable reactor type.

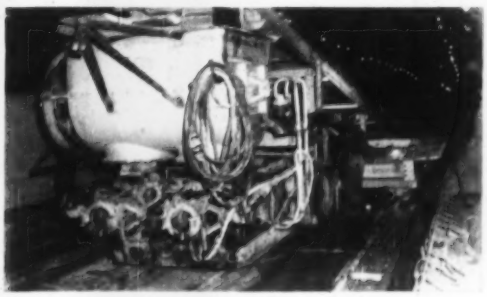


Third tube of Lincoln Tunnel, under the Hudson River. Owner and Engineer: The Port of New York Authority. General Contractor: Joint Venture—Mason, Johnson and MacLean, New York City. Pozzolith Ready-Mix concrete produced by Hudson Builders Material, Inc., Jersey City, N. J

Ready-mix truck on top side of tunnel discharges concrete into "elephant trunk" . . .



Concrete goes down "elephant trunk" to buggies in tunnel . . .



Concrete pump receives concrete from buggies and pumps it into tunnel lining forms.

"Triple-Play" Concrete . . . with POZZOLITH

From ready-mix truck . . . to buggy . . . to concrete pump . . . to tunnel lining—"triple-play" handling while retaining good flowability and minimum bleeding—this was the performance of concrete produced with Pozzolith in the construction of The Port of New York Authority's $100,000,000 Lincoln Tunnel third tube.

Concrete in the *hardened* state was also improved—compressive strength tests were above specifications, and appearance is excellent.

These results were obtained with Pozzolith because it produces desired workability with lowest water content, and because Pozzolith is key to the control of entrained air, and control of rate of hardening.

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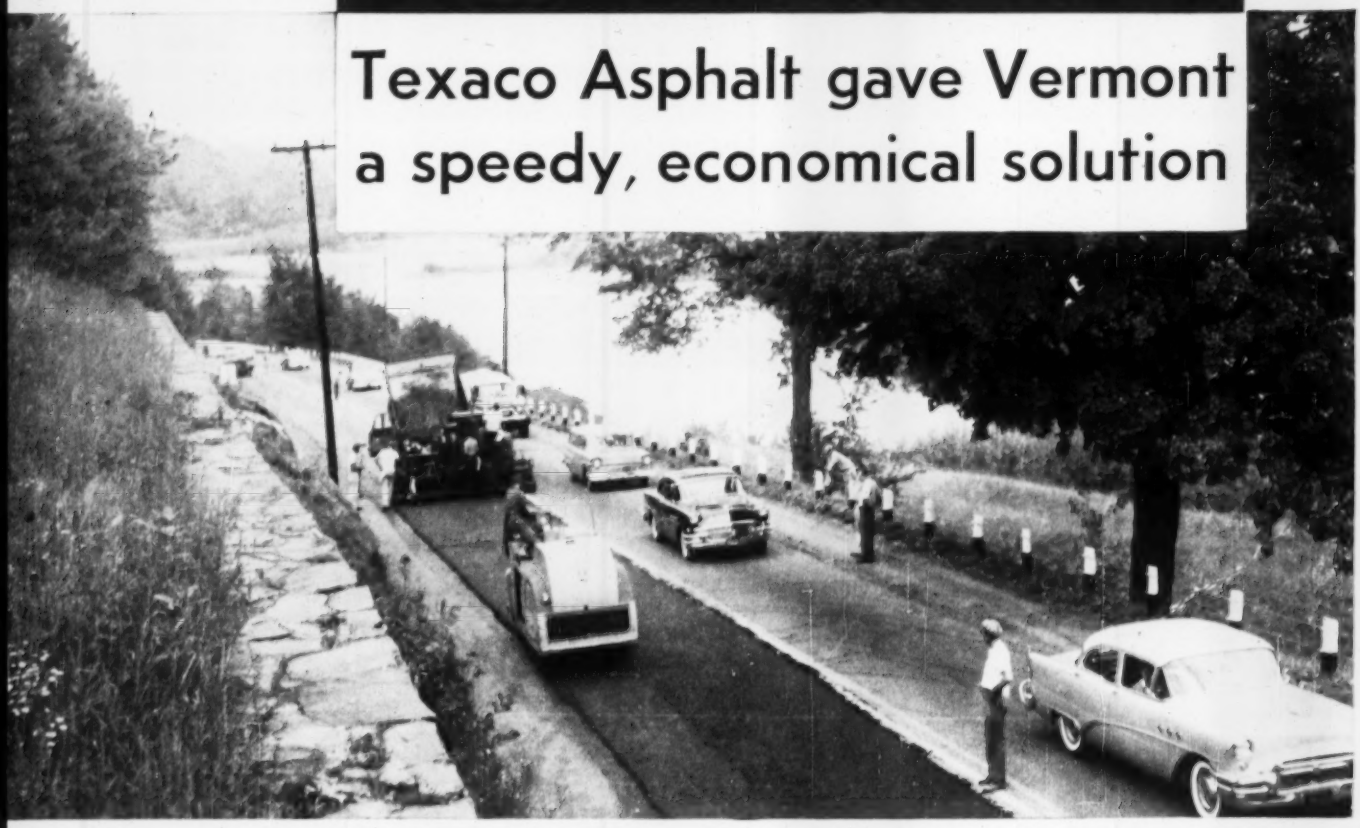
Traffic outgrew this highway

Texaco Asphalt gave Vermont a speedy, economical solution



Modernizing US-5 in Vermont with a plant-mixed Texaco Asphaltic Concrete wearing surface, laid without interrupting traffic.

Contractors

Cold River Hot-Mix Corporation No. Walpole, N. H. Frank W. Whitcomb Construction Company, No. Walpole, N. H.

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Old bituminous-treated gravel road at right provides an excellent base for new Texaco Asphaltic Concrete surface.

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